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ABSTRACT

A great challenge facing Colombia is how to become an active member of the new global information and knowledge society. The changes required for this transition mean that the role of tertiary education must also shift to add to the traditional tasks of the transmission of knowledge and providing basic research the roles of training adaptable workers and supporting the continuing expansion of knowledge. A diversified system would include good quality technical and short cycle programs as well as postgraduate programs of high standard. This sector study suggests potential strategies and recommendations that would advance tertiary education in Colombia. The first chapter, "The Current Status of the Tertiary Education Systems in Colombia," describes the current system and its users, governance, and linkages with technology. The second chapter, "Economic Issues and Perspectives," provides an economic perspective on tertiary education in Colombia and examines the functioning of the market for tertiary education. This chapter identifies two main obstacles to expansions; rationed number of available places and stifled demand in private higher education. The final chapter, "Strategies and Recommendations for Tertiary Education in Colombia," contains the strategies and policy recommendations that support the government's policy by focusing on: (1) ensuring clear and progressive governance; (2) inducing and assuring quality; (3) promoting strategic levels of education and fields of study; and (4) providing finance for equitable and expanded access. Seven annexes discuss specific issues related to the future of higher education. (Contains 57 figures, 45 tables, 10 boxes, and 201 references.) (SLD)

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A WORLD BANK COUNTRY STUDY

ED 479 536

Tertiary Education in Colombia

Paving the Way for Reform

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Tertiary Education in Colombia

Paving the Way for Reform

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ABSTRACT

Education is a major instrument for economic growth and poverty reduction. Rapid changes in technology, globalization and economic reforms are creating dramatic shifts in the structure of economies and labor markets throughout the world. The challenges of the future lie with confronting traditional limitations within a rapidly changing environment. This transformation has already occurred in advanced economies and increasingly so in Latin America. Colombia's great challenge is how to become an active member of this new global society, the information and knowledge society.

These changes imply that the role of tertiary education must also shift. While tertiary education's traditional role has been to train students for employment through the transmission of knowledge and by providing basic research, it must add to these tasks the training of adaptable workers and supporting the continued expansion of knowledge. An enhanced tertiary education sub sector enabled to respond to society's increasing needs for high quality human capital must count on dynamic capacity for monitoring and evaluation, and disseminate to all stakeholders information about tertiary education its opportunities and costs, and include information about labor market perspectives; it must cater for students from all groups of the society by promoting greater equity in access to university and technical tertiary education and training; and finally it must diversify and provide flexible academic credit transfer mechanisms between tiers of tertiary education and institution, in this context the country must see itself within a global framework and stimulate internalization of its system. A completely diversified system would include good quality technical and short cycle programs as well as post graduate programs of high standard.

This sector study, *Tertiary Education in Colombia: Paving the Way for Reform,* suggests potential strategies and recommendations that would move the Tertiary Education sector forward by providing the flexibility to become more responsive to demands from society, from students, and from the labor-market.

The first chapter of the study describes the current tertiary education system. This chapter presents analysis on the individuals who take part in the system: the students (users), providers and the academic personnel. Further, the chapter examines the governance and management of the system within an institutional and stakeholder analysis, which includes specific sections on the quality assurance system, disciplines and programs offered by the system. Finally, this chapter investigates linkages between the tertiary education and science and technology within Colombia, and linkages between national tertiary education institutions and international providers.

The second chapter provides an economic perspective to tertiary education in Colombia. It presents the growing economic importance of tertiary education and the skills it provide for economic progress. Further, it examines the functioning of the market for tertiary education and argues that the country faces two main obstacles to expansion: rationed number of available places and stifled demand in private higher education.

The third and final chapter contains strategies and policy recommendations that support the Government's policy by focusing upon four core issues: (i) ensuring clear and progressive governance, (ii) inducing and assuring quality, (iii) promoting strategic levels of education and fields of study, and (iv) providing finance for equitable and expanded access.

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PREFACE

The Government of Colombia is examining options for improving the higher education sector over the next decade. As part of that process, the World Bank, at the behest of the Government, undertook an assessment of the state of tertiary education and made recommendations on how its funding, governance, structure, and scope could be reformed to better meet the needs of the country and the challenges it will face in a global market economy.

In the first phase of the assessment, consultation with the Government and the tertiary education institutions themselves identified two key issues that were impacting the growth and development of the sector: (i) coverage was sub-optimal and demand for equitable access to tertiary education was increasing due to the substantially expanded pool of eligible students graduating from secondary school; and (ii) current graduates from tertiary institutions were not sufficiently meeting labor market demands for a highly trained and flexible workforce due to low quality programs and the inadequate output of graduate and post-graduate degree holders in fields important to national development.[1]

In phase two, a number of studies were carried out in order to produce a series of background papers focusing on issues identified as important for the growth and development of tertiary education in Colombia. The purpose was to move towards operationalizing the substantial knowledge base which has been created about Colombian tertiary education over the last decade. The paper, *Colombian Tertiary Education in the Context of Reform in Latin America*, by José-Joaquin Brunner, analyzes the underlying causes behind the underdevelopment of Colombia's higher education system, the challenges it is currently facing and the transformations and policies that could be implemented to forge the necessary changes. Martha Laverde has addressed the systems institutional setup in: *Institutional Assessment of the Tertiary Education Sector,* which details how poor governance and the lack of a long term vision for the sector have resulted in duplication of responsibilities in the governing units and a lack of clarity in their roles. The concern about quality in tertiary education and the mechanisms in place to ensure quality in Colombia are discussed in the fourth paper *Quality Assurance in Colombia,* by Robin DePietro-Jurand and Maria-José Lemaitre. The challenges for Colombia's national innovation system could not be underestimated. In *Science and Technology: Status and Perspectives,* Natalia Agapitova, Lauritz B. Holm-Nielsen and Goga Vukmirovic demonstrate that while all of the essential elements of an innovation system are present in the country, due to a lack of finance, a poor scientific base, and limited labor competencies, the national innovation system is substantially underdeveloped and incoherent. The marketplace for knowledge is global. How does Colombia fare in this market? Over the last decade, foreign institutions have begun to play an ever expanding role in the Colombian market for higher education, migration of Colombian graduates (brain drain) is on the rise, and globalization in general posing a challenge to Colombian higher education. These issues are discussed in the paper *Colombian Higher Education in the Global Market*, by Isabel Cristina Jaramillo, Patricia Garcia and Andreas Blom. The economic opportunities are dealt with in *Economic Perspectives of Higher Education* by Andreas Blom and Thomas Hansen who investigate two central markets surrounding higher education in Colombia: the market for higher education itself and the labor market for workers with higher education. Finally, the seventh paper by Arthur Hauptman, *Reforming Student Financial Aid in Colombia: Issues and Alternatives* examines the student aid structure in Colombia and recommends principles to guide its reform. The seven background papers may be found in the Annexes to this report.

A two-day policy workshop held on the 30–31 of January 2002 in Bogotá, Colombia, was the third phase of the assessment process. The workshop, hosted by ASCUN in collaboration with DNP

1. The impact of the half century civil war in Colombia cannot be discounted as a major factor shaping the society and impacting on an individual's and a family's decision to invest in tertiary education. This issue is addressed in the main text of this report.

and MEN, brought together a working group, led by the former Minister of Education Mr. Francisco José Mera Lloreda, of selected high-level Colombian policy makers and tertiary education actors, rectors, faculty and students, a panel of international policy experts, and Bank staff. The main objective of participants was to engage in a dialogue for change, based on a realistic assessment of where Colombian higher education should be heading.

The fourth and final phase of the assessment was the production of this report, *Colombia: Tertiary Education Paving the Way for Reform*, which discusses the ways Colombia might address the main issues confronting its tertiary education system. The first section of the education sector work describes the current tertiary system. The second section provides an economic perspective and argues that the country faces two main obstacles to expansion: rationed number of available places and stifled demand in private higher education. Further, it makes a case for reforming and enlarging the current financial aid program for students in order to stimulate the demand for tertiary education and to induce equitable access. The third and final section contains strategies and policy recommendations, which would enable Colombia's tertiary sector to respond to the needs of the country with increased equitable access to more relevant education of good quality.

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A special word of thanks for the presentations, conversations, feedback and comments received from all the participants—rectors, students, professors, politicians, academics, the press and other interested parties—of the two-day workshop in Bogotá on January 30–31, this wealth of inputs have greatly benefited the report. We are especially grateful to ASCUN, in collaboration with DNP and MEN, for having organized such a successful workshop.

The study would have been impossible without the collaboration and information supplied by Ministry of Education, DNP, ICFES, ICETEX, COLCIENCIAS, CNDM and CNA. In particular, the team would like to thank Francisco Reyer, ICFES, William Zamudio and Jose Luis Acero, ICETEX, and Julio Jimenez, German Arenas and Edgar Baldion, DNP for providing invaluable statistics for this study.

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The report was prepared under the overall guidance of Olivier Lafourcade (Country Director), Ana-Maria Arriagada (Sector Director), Marito Garcia (Education Sector Manager) and Mark Hagerstrom (Sector Leader). The peer reviewers for this sector study were Eduardo Velez Bustillo, William Experton and Carlos Eduardo Velez.

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Currency Equivalents

Currency Unit = Colombian Peso 2,820 = US$ 1.00 (Exchange Rate Effective: December 17, 2002)

Fiscal Year	Academic Year (AY)	Weight and Measures
January 1–December 31	February–November	Metric system

Abbreviations and Acronyms

ASCUN	Asociación Colombiana de Universidades
CIDEIM	Centro Internacional de Entrenamiento e Investigaciones Médicas
CIB	Centro de Investigación Biológicas
CIF	Centro Internacional de Física
CNDM	Comisión Nacional de Doctorados y Maestrías
CESU	Consejo Nacional de Educación Superior
CNA	Consejo Nacional de Acreditación
COLCIENCIAS	Instituto Colombiano para el Desarrollo de la Ciencia y la Tecnología
COLFUTURO	Fundación para el Futuro de Colombia
DANE	Departamento Administrativo Nacional de Estadística
DES	Dirección de Educación Superior
DNP	Departamento Nacional de Planeación
ECES	Exámenes de Calidad de la Educación Superior
FEDESAROLLO	Fundación para la Educación Superior y el Desarrollo
FNG	Fondo National de Garantías
FODESEP	Fondo de Desarrollo de Educación Superior
GOC	Government of Colombia
GDP	Gross Domestic Product
ICFES	Instituto Colombiano para el Fomento de la Educación Superior
ICETEX	Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior
ICT	Information and Communication Technology
IDB/IADB	Inter-American Development Bank
IP	Intellectual Property
HE	Tertiary Education
LA	Latin America
LAC	Latin America and the Caribbean
MEN	Ministerio de Educación Nacional
NIS	National Innovation System
OECD	Organization for Economic Cooperation and Development
RCI	Red Colombiana de Cooperación Internacional
SNIES	Sistema Nacional de Información de la Educación Superior
S&T	Science and Technology
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United States of America
USD	Dollars, United States of America

EXECUTIVE SUMMARY

Education is a major instrument for economic growth and poverty reduction. Rapid changes in technology, globalization and economic reforms are creating dramatic shifts in the structure of economies and labor markets throughout the world. These changes imply that the role of tertiary education must also shift. While tertiary education's traditional role has been to train students for employment through the transmission of knowledge and by providing basic research, it must add to these tasks the training of adaptable workers and supporting the continued expansion of knowledge. An enhanced tertiary education sub sector enabled to respond to society's increasing needs for high quality human capital must count on dynamic capacity for monitoring and evaluation, and disseminate to all stakeholders information about tertiary education its opportunities and costs, and include information about labor market perspectives; it must cater for students from all groups of the society by promoting greater equity in access to university and technical tertiary education and training; and finally it must diversify and provide flexible academic credit transfer mechanisms between tiers of tertiary education and institution, in this context the country must see it self within a global framework and stimulate internalization of its system. A completely diversifies system would include good quality technical and short cycle programs as well as post graduate programs of high standard.

Tertiary Education in Colombia Today

Colombia has a long and rich tradition in Tertiary Education in Latin America. Over the last decade enrollment in tertiary education mushroomed resulting in coverage expanding from nine per cent to sixteen percent. This development was part of an evolution towards massification, diversification and modernization of the tertiary education landscape. In the end of the 1990s, Colombia experienced its worst economic performance in over 60 years. GDP decreased from an average of 3–4 percent during the first half of the 1990's to –4.5 percent in 1999. In spite of showing signs of economic recovery, the increases in unemployment and poverty arising from the economic crisis continue to pose serious threats to the welfare of the poor and vulnerable. The crisis has also had a

negative impact on enrollment at all levels of education. In 1996 and 1998, enrollment of 7–11 year olds from the poorest families declined from 87.3 percent to 83.2 percent respectively while enrollment rates of 12–17 year olds fell from 66.3 percent to 64.6 percent in 1998. Tertiary Education, which had been expanding throughout the 1990's, also saw a decline in the number of new entrants from a high of 256,672 in 1997 to 207,246 in 1999, a decline of 19 percent. These economic and social difficulties are compounded by the costly conflicts with the guerrillas and other violent elements in Colombia (World Bank, 2001).

The Students. In Colombia, as is true almost everywhere in the world, coverage rises with income. **Although the education system expanded in the 1990s, the inequality in access to tertiary education didn't improve.** The largest gains in coverage occurred in the fifth quintile where net coverage rose from 23 percent to 40 percent. However, the highest growth rate took place among the first quintile, where the number of students expanded by 170 percent. Yet, less than six percent of the 18–24 year-olds attending Tertiary Education are from the first quintile. The fundamental reason for inequalities at the tertiary level is inequality in the basic education system. However, the status quo in inequality in access to tertiary schooling has a negative impact on inequality in the future, as the high pecuniary gains from tertiary education imply that the existing difference in access translates into high income inequality in the future. Improving access to Tertiary Education for lower and middle-income groups is therefore an important remedy to mitigate future inequalities.

The Providers. **The Colombian Tertiary Education system is diverse in that it consists of both public and private institutions in both the university and non-university tiers.** Diversity allows choice and responsiveness to varying needs and circumstances. There are four types of tertiary education institutions each with its own unique role: Universities, University Institutions, Technological Institutions, and Technical Training Institutions. While the universities serve as teaching institutions, they also serve the community and provide basic research useful to their field and/or their country. Non-university institutions complement universities in that they provide courses that respond flexibly to the demands of the labor market and have lower per student costs. Eighty-six percent of students enrolled in Tertiary Education attend universities and university institutions while the remaining 14 percent are enrolled in technological and technical training institutions.

System Governance and Management. The current regulatory framework in Colombia is a blend of the old school of thought, in which the role of the government was to control tertiary institutions, and the new school, which supports autonomy with accountability in universities and government regulation and oversight of non-university institutions. Four external factors were found to impact on governance: (i) changes in the labor market, specifically, the demands for technology and the speed with which the technology changes, require that workers have the skills to select, adapt, and apply existing technologies properly and remain active, lifelong learners; (ii) changes in the demand for tertiary education which is expected to rise as the proportion of youth attending and completing secondary school continues to climb; (iii) the fiscal crisis in Colombia, which has resulted in both a serious drop in the demand for university places and to fiercer competition among institutions to win available students; and (iv) the violence in Colombian society which has brought about intolerance and social disintegration and has led to frequent shutdowns, interruption of classes, and a hostile atmosphere in universities that is not conducive to learning or to the spread of democratic values. With respect to management, **the two greatest obstacles to effective management in Colombian Tertiary Education are regulatory bodies with overlapping functions,** resulting in duplication of functions and programs and confusion both within the governing organizations and the tertiary institutions, **and the lack of a coherent sector plan** to efficiently guide the sector's development.

Quality Assurance. There are a number of different agencies and mechanisms, all trying to ensure quality in some aspect of Colombian Tertiary Education. While not all of the mechanisms can be considered strictly quality assurance mechanisms by international standards, the accreditation system in Colombia has stimulated improvements in participating programs and institutions. The types of quality assurance mechanisms in use run the gamut from simple registration of programs to full-fledged accreditation of excellence. While progress has been made in quality assurance **there are two primary underlying problems: the number of accredited programs is quite small and there seem to be several entities with similar mandates,** or one institution attempting to carry out many different functions. What is necessary are improvements that provide some measure of organization to the different quality assurance mechanisms so that institutions and their programs move along a continuum that promotes increasing levels of quality and an increasing sense of institutional commitment with quality.

Teaching Personnel. The student-faculty ratio in public institutions for 1997 was 17, which is relative low compared to other countries of the region, considering faculty do very little research and consulting. Yet their unions continuously battle for reduced teaching loads. In private universities the student-faculty ratio is much higher at 74 students for each full-time faculty member resulting in an average class size of 47. Classes this large tend to restrict students to taking a passive role in learning limited to note taking, memorization, and repetition, and except for a few notable exceptions, most faculty in private universities do not conduct research. The qualifications of the academic staff have improved over the last 14 years with nine out of ten teachers currently holding graduate credentials. However, **only two percent of staff have a postgraduate diploma** and in 2001, the Tertiary Education system produced only 16 graduates with PhDs. Given the low output in Colombia of PhDs, the country could experience a crisis in terms of meeting their staffing needs with adequately qualified academics, thus reducing the quality of teaching and research.

Unprecedented Expansion. While tertiary enrollment in Colombia is well below other countries in the region, it has outperformed many of its neighbors when it comes to the magnitude of the increase in coverage. **During the last decade, coverage surged 150 percent;** only Chile has performed better in the region. **However, between 1997 and 2000 the number of new entrants to tertiary education declined by 19 percent** corresponding to a total decline of over 100,000 students. This decline was in all likelihood due to the severe economic recession that struck Colombia in 1998. The economic downturn both stifled families' ability to pay fees for Tertiary Education and reduced the state's available resources for public Tertiary Education. The private sector has been most responsive to the increased demand for Tertiary Education, accounting for almost 67 percent of total enrollment and 40 percent of enrollment in evening and night courses. During the 1990's enrollment in the private sector grew at a rate of 25 percent per year, compared to an expansion rate of just 10 percent per year in the public sector. The slower growth in the public sector can be attributed to both the lack of resources necessary for expansion, an inappropriate incentive structure, and the lack of a cohesive policy framework to govern the sector and move it towards improved efficiency.

Colombia has unbalanced enrollment and under-invests in both Technical and Graduate Education. The share of students enrolled in the social sciences is higher in Colombia than in Latin America in general. In 1996, **less than 15 percent of students at the Master's level were enrolled in the natural sciences, engineering, and agricultural sciences,** compared to 37 percent for the region. The opposite is the case for the social sciences, in which 73 percent of graduate students in Colombia are enrolled, compared to a regional average of 37 percent. For undergraduates the pattern is the same: 27 percent of Colombian undergraduates are enrolled in technical programs, while the regional average is 43 percent. In 2001, of the approximately 10,000 programs offered

in Tertiary Education 4,496 were graduate programs and 47 were PhD programs. However, only six percent of total enrollment is in graduate and post-graduate programs and most of that, 77 percent, is provided in private institutions at the "Specialization" level.

Struggling S&T Education. The Science and Technology (S&T) sector in Colombia has several strong points: (i) Centers of excellence have been established utilizing both national and multilateral resources and, in accordance with international best practice, funding has been distributed by awarding block-grants to research through competitive mechanisms; (ii) the level of investment in information and communication technology (ICT), compared to its regional competitors, is impressive in Colombia with a well developed information infrastructure fast approaching the G7 level; and (iii) the Colombian private sector is technologically well developed with a value added of high and medium-high industries at seven percent of GDP, almost equal to that of the average OECD country. However, the production of knowledge-based industry declined 20 percent since 1994 and **9 out of 10 firms in the largest knowledge-based industry cite lack of advanced human capital as the primary obstacle for innovation.**

Internationalization of Colombian Tertiary Education. Internationalization allows institutions to engage in collaboration and other activities, which help to improve the quality of tertiary education and position society better in the globalization process. **Attempts at internationalization in Colombia have been fragmented in the absence of a well-defined policy framework.** Although some universities have developed the internationalization culture, many have been timid in their efforts to overcome their parochialism despite an enabling legal framework. A clear political commitment is needed from the Government and from the tertiary education institutions themselves, in order to break the relative isolation of Colombian tertiary education and for the country to fully benefit from progress made elsewhere.

Economic Issues and Perspectives

The value of tertiary education for both society and for individual has continued to increase over the last two decades. The economy therefore stands to gain considerably from an expansion of tertiary education. Colombia faces two main obstacles to expansion: a rationed number of seats in the low-fee charging public universities and stifled demand in tuition-based private education. There seems to be room for improved internal efficiency in the management of public institutions. This could be spurred through provision of incentives to efficient management.

Improving External Efficiency. **The productivity of workers with tertiary education has risen considerably over the last decade** due to adjustment of the Colombian economy, including deepened integration into the world economy and technological progress. Still, only 11 percent of Colombian workers have attended some form of tertiary education—compared to 24 percent of the labor force in industrialized countries—significantly undermining the country's competitiveness. In addition, Colombia faces another problem—that of brain drain. While no exact figures are available, a survey of obstacles to innovation carried out by the National Department of Planning identified human capital as the predominant barrier to technological progress in the country. The private benefits of tertiary education are high. Workers with tertiary education earn 275 percent more than the average worker and more than 6.5 times the wage of a worker with no education. The private returns to each year of tertiary education reached 22 percent in 2001, which more than double of the returns found in developed countries. These data indicate that reversing the decline in entrants into tertiary education could yield substantial benefits to individuals and to society.

A Segmented Market for Tertiary Education. The private benefits from tertiary education are substantial and have increased over the last several years. While demand for tertiary education has grown, supply has surpassed demand. Public tertiary education continues to be in strong demand,

outstripping supply and leading to rationing in the market for public tertiary education. The opposite is true for high-fee charging private education, where supply exceeds demand. This suggests a distinct segmentation of the market for tertiary education, where households clearly distinguish between the low fee-charging public sector and the high-fee charging private sector. **Expansion could, hence, occur either by expanding supply in the public sector or through stimulation of demand in the private sector.**

Funding a Selective and Efficient Public Sector. Faced with a surging number of secondary graduates wanting to enter state institutions, public institutions in Colombia have responded by diversifying their revenue base through the introduction of tuition to accommodate more students. The speed with which demand for advanced education occurred outstripped the government's capacity to finance it, thus encouraging the growth of private institutions to ease pressures on the public purse and to satisfy demand. With a thriving private sector, the public sector can now focus on tasks that benefit society and which private sector providers are unwilling to assume. **The public institution serve their purpose by offering courses in under-served regions of the country and in disciplines of perceived high social value.** It will be through a strengthened redirection of public resources towards areas where the social value exceeds the private value, that public institutions would best serve their mission.

Efficient Use of Public Funding. To serve the country in the best way, the public sector not only has to prioritize strategic areas of high social value, but also has to educate students efficiently. Colombia invests only 4% of GNP in education, which is low; however, the relative funding for tertiary education in Colombia—16 percent of the total education budget—is in line with international best practice (15–20% range). In an international comparison, the Colombian university system lies at the high end of the cost scale, 105 percent of GDP per capita, when comparing per student expenditure. This is partially driven by **higher unit costs in the public universities, which spends 29 percent more per student than private universities.** One year in a public university costs Col$4.2m compared to the unit costs of Col$3.3m in a private university. The cost-difference is linked to a difference in spending patterns. State run universities spend 42 percent of their budgets on salaries to academic staff compared to 34 percent in the private universities. The internal efficiency of the public sector could be spurred by introducing performance based funding.

Filling the Vacancies in the Private Sector. The private sector offers courses that are affordable and available only to well-off segments of the population and therefore should not be considered a panacea to the production of advanced human capital in Colombia. Tuition levels in private institutions vary according to institution and type. Universities charge the highest yearly fee, followed by the newer University Institutions. The least expensive tertiary option is the Technical Training Institutions which charge less than half the fee of universities. **An accommodation of the high demand for tertiary education through an expansion of technologically oriented courses would reduce the required investment burden by more than a half.** This kind of diversification of tertiary education has only recently taken hold in Colombia where enrollment in technical education is about 14 percent, low by modern standards.

Short Term Crisis Reduces Long Term Investments in Education. The short-term economic disruption Colombia is experiencing will have serious, permanent repercussions on the future earnings of those who exit the education system, since these individuals are less likely to re-enter. Therefore, declines in human capital will be a factor holding back economic progress in the country. Since **a shortfall in disposal income is the prime culprit behind the decline in entrants into tertiary education,** one policy remedy would be to increase access to financial aid. An extensive student loan scheme in Colombia could have shielded long term investments in

human capital from the short-term economic crisis, perhaps averting the decline in the number of secondary school graduates who chose not to enter tertiary education. Moreover, and perhaps more importantly, a deferred payment scheme could have permitted academically able graduates from secondary schools to continue onto tertiary education regardless of family income. Currently, the overall aid structure in Colombia is biased towards the middle class because a large proportion of the aid provided is devoted to credit rather than to scholarships, and because in order to receive a loan, students must secure the signatures of two guarantors. Consequently, low-income students receive relatively little in the way of aid. International evidence has shown that loans are often insufficient by themselves in financing tertiary education for students from the lowest income groups. Scholarships—awarded on the basis of both financial need and academic merit—are needed to attract those students.

Strategies and Recommendations for Tertiary Education in Colombia

The challenges of the future lie with confronting traditional limitations within a rapidly changing environment. This transformation has already occurred in advanced economies and increasingly so in Latin America. Colombia's great challenge is how to become an active member of this new global society—the information and knowledge society which integrates technological and professional networks, platforms for improved innovative capacity, flexible labor markets and demand driven life-long-learning systems. This sector study suggests potential strategies and recommendations that would move the Tertiary Education sector forward by providing the flexibility to become more responsive to demands from society, from students, and from the labor-market. The strategies and recommendations support the Government's policy as it was recently stated by focusing upon four core issues: (i) ensuring clear and progressive governance, (ii) inducing and assuring quality, (iii) promoting strategic levels of education and fields of study, and (iv) providing finance for equitable and expanded access. Colombia could:

Ensure Clear and Progressive Governance:

- ☐ Create an effective institutional arrangement for designing and implementing Tertiary Education policies centered on existing agencies.

Induce and Assure Quality:

- ☐ Allow the creation of private accrediting bodies accredited by the CAN, *Consejo Nacional de Acreditación* or other national agency.
- ☐ Establish a new framework for accreditation that relies less on Input-based Criteria.
- ☐ Keep, but clarify and revise the quality accreditation system.

Promote Strategic Levels of Education:

- ☐ Expand enrollment in technical and technological courses.
- ☐ Increase the availability and quality of postgraduate training, especially at the Doctoral level that provides both faculty training and upgrading as well as training for higher level human resources in fields of national priority.

Provide Financing for an Equitable and Expanded Access:

- ☐ Reform the current student aid scheme.
- ☐ Design a system of scholarships for the very poor—those in the lowest two quintiles.
- ☐ Implement performance based funding of public institutions that would reward high-performing, quality public institutions.

I

THE CURRENT STATUS OF THE TERTIARY EDUCATION SYSTEM IN COLOMBIA

Colombia has a rich tradition in Tertiary Education in Latin America dating back over a century. For years, the privilege of attaining Tertiary Education was reserved for the wealthy and secondary school served primarily as preparation for Tertiary Education. The second half of the twenties century have seen fundamental changes in Colombian society and in the context of the Colombian Tertiary Education sector.

- ***Continued and progressive development of primary and secondary education*** have produced a substantially expanded pool of candidates for tertiary education. These potential students and their families—believing in the right to equal opportunities—expect the State to secure access to quality, Tertiary Education.
- ***The emergence of a global, knowledge-based economy*** became a driving force behind Tertiary Education reform. The demands of the labor market for technology and the speed with which technology changes, required—and requires now even more—a growing pool of flexible workers that have the skills to select, adapt, and apply existing technologies and remain active, lifelong learners.
- ***Thirty-eight years of civil war*** have brought about intolerance and social disintegration and have, within the universities, led to frequent shutdowns, interruption of classes, and a hostile atmosphere that is not conducive to learning nor to the spread of democratic values.

The government and Tertiary Education institutions have responded forcefully to these challenges with the passing of Ley 30 in 1992 that reinvigorated the sector and established the foundation for the unprecedented expansion in enrollment. In the mid 1990s, tertiary education institutions mushroomed resulting in coverage expanding from nine percent to 16 percent. This development was part of an evolution towards massification, diversification and modernization of the tertiary education landscape. However, as in the case of most Tertiary Education systems, the experience of rapid growth and increasing heterogeneity brought awareness that quality was declining and that equity remained an issue.

The sector's structural weaknesses following rapid expansion were compounded by the worst economic recession in Colombia in over 60 years, which culminated in 1999, with an economic retraction in GDP of –4.5 percent. While recent figures show a modest recovery in 2000 and 2001, the decline influences nearly all other areas of the economy. The gains that were made in terms of poverty reduction since the 1970s have been partially lost. The crisis has also had a negative impact on education at all levels. The National Planning Department estimates that enrollment of 7–11 year old children from the poorest families declined from 87.3 percent in 1996 to 83.2 percent in 1998. In Tertiary Education, the crisis resulted in a most unfortunate reversal from an increase in entrants to tertiary education to a decline amounting to 100,000 students during the three years of crisis and perhaps a decrease in the quality and relevance of programs as well.

In tertiary education, the main task for the government has been to continue strengthening its role in Tertiary Education as a strategic provider, clear regulator and facilitator. To succeed in this endeavor, Colombia will need to establish a coherent policy framework for the Tertiary Education sector.

The report recognizes the high competence and commitment of every stakeholder in the sector and the effectful steps taken in the past. If the critical appraisal that now follows dwells disproportionately on the shortcomings of the sector, it does so with the intention of moving the sector forward for the benefit of the sector's current and future participants. As a partner in the sector, the World Bank seeks—through this report—to provide analysis to the sector's stakeholders in order to contribute to the forging of a consensus for a long term, coherent policy framework, without which policy initiatives are unlikely to achieve their objectives. Implementation of such a policy framework would be an important step towards accommodating the ever increasing demand for skills of the Colombian population and of the economy and foster a more socially cohesive, peaceful and economically prosperous Colombian society.

The Students

The foremost beneficiaries of the tertiary education system are the students. This section discusses the characteristics of the student population and their background with a special focus on equity. Despite being the prime recipients of tertiary education, many systems are not designed to deal with this civil constituent. But it is a well-known fact that failing to accommodate the interests of students can severely damage the functioning of an entire Tertiary Education system.[2] In Colombia, *La Ley 30 de 1992* obligates every Tertiary Education establishment to assure that the students hold "democratic representation" in the management of institutions. Recent inspections by ICFES of selected institutions revealed that one in five institutions failed to comply with this requirement.

Characteristics of the Students

Available data of students between 18 and 25 years old living in the ten largest metropolitan areas reveal a diverse student population (Table 1) where females outnumber males and over 25 percent of all students work besides studying. In general, students who work assume more than just part-time positions, with the average number of hours worked approximately 34. Such large amounts of time spent earning an income inevitably reduces the effort put into the learning process and hence the value of the investment.

The high share of students working testifies to the high costs of studying in Colombia. Such high costs imply that family income plays a dominant role for access to Tertiary Education.

2. In 1999 in Mexico UNAM, the largest university of the country (270,000 students), was closed down for almost a year by a student strike in response to a proposed tuition fees increase from a few dollars to 140 dollars a year. Source: World Bank (2001).

TABLE 1: CHARACTERISTICS OF THE URBAN STUDENT POPULATION
(compared to the population of 18–25 year olds)

	Female	Employed	Wage (only workers)	Hours worked per week (only workers)
Students	54.2%	25.7%	98,719	34.0
Others	53.9%	47.0%	123,261	46.1

Source: Encuesta National de Hogares, September 2000, DANE.

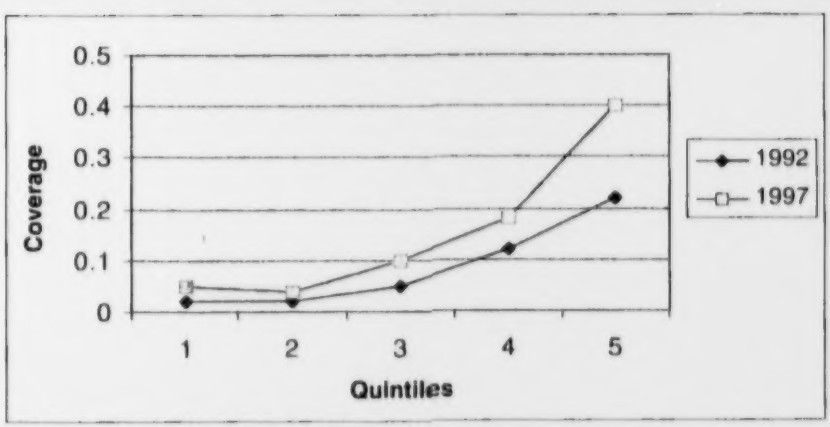
No Improvements in Equity

Equity can mean different things, for example: (i) a reasonable degree of equality of opportunity to participate in Tertiary Education, and (ii) a fair balance between paying the costs of and obtaining the benefits from Tertiary Education.

Figure 1 presents Tertiary Education coverage by quintile. As is common for all Tertiary Education systems, coverage rises with income. In 1992, before the major expansion of the tertiary education system, coverage grew moderately with income. Approximately two (2) percent of the relevant age-cohort from the poorest quintile was enrolled in a tertiary education institution compared to 20 percent for the best-off quintile. As the education system expanded in the 1990s, the inequality in access to tertiary education grew in absolute terms. The largest gains in coverage occurred in the fifth quintile where net coverage rose from 23 percent to 40 percent. However, relative to the starting point, the highest growth rate took place among the poorest, the first quintile, where the number of students expanded by 170 percent. Yet, less than six percent of the 18–24 year-olds from the first quintile attend Tertiary Education institutions.

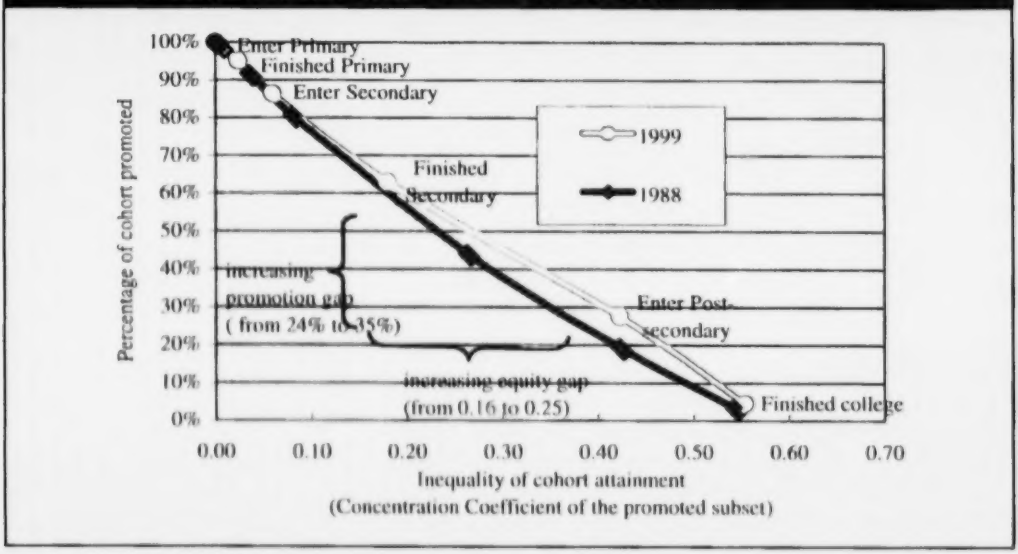
Urban household data show that the economic recession in the late 1990s effected enrollment among all income groups. However, coverage among the low-income groups suffered the most.

FIGURE 1: HIGHEST ABSOLUTE EXPANSION AMONG THE WEALTHIEST QUINTILE
(National Coverage by Quintile, 1992 and 1997)



Source: World Bank (2001) based on Encuesta de Hogares from DANE

FIGURE 2: THE TERTIARY BOTTLENECK
(Efficiency and Equity of Educational Attainment 1988–1999)



Source: World Bank (2002).

From 1998 to 1999, coverage declined by 0.5 and 0.8 of a percent in the poorest two quintiles, while it increased slightly among the rest of the population.

The fundamental reasons for inequalities in tertiary education are found outside of the system, particularly in the basic education system, including early childhood education. In 1980, out of a cohort of 523,000 seventeen-year-old graduates from secondary school, 134,000 or 26 percent of them, took the entry exam for Tertiary Education and were eligible to attend. As of 2000, the number of graduate had increased to 583,000 (60 percent) graduates of out of a cohort of 752,000 implying that the tertiary education sector is now better positioned to improve equity within the sector than it was in 1980.[3]

While the 1990s saw substantial improvements in equity and efficiency in both basic and secondary education, progress has been uneven. Figure 2 shows that in 1988 ninety-nine out of 100 students entered primary school and 92 completed it. Meanwhile, 81 students out of 100 entered secondary but only 44 finished. In the same year, barely 19 out of 100 students entered post-secondary education. The figure illustrates both the significant improvements in equity and completion rates in primary and secondary education, but also the increasingly tight bottleneck at the entrance to tertiary education with mounting frustration for those in the low-and middle classes.

The educational system as a whole has become more efficient at every stage of the educational ladder as indicated in the upward shift of the curve in Figure 2. Promotion and completion rates have increased for both primary and secondary education between 1988 and 1999: from 92 to 95 percent completion of primary school and from 44 to 63 percent completion of secondary school. The transition rate from primary to secondary improved slightly from eight percent to nine percent in 1988, and from nine percent to ten percent in 1999. The slope of the "blue" curve shows that access to higher levels of educational is more unequal; that is, in each of those levels the proportion of poor students entering the higher grades is lower than in the previous stage. Nevertheless, the shift to the

3. Source: ICFES and DNP.

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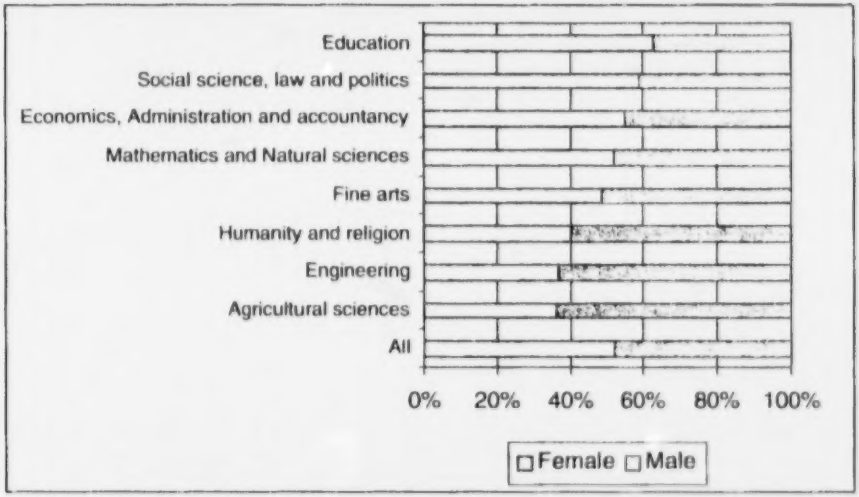
FIGURE 3: FEMALES FOCUS ON SOFT DISCIPLINES
(Gender by Field of Study, 1999)



Source: ICFES (1999)

left from 1988 to 1999–from the blue to the red curve–reveals substantial improvements in equity for all grades up through high school. The only exception is the transition between high school and post-secondary education (university and technological). Figure 2 also shows that from 1988 to 1999 both the promotion and equity gaps have widened—the promotion gap from 24 to 35 percent and the equity gap from 16 to 25 percent meaning that the gap between secondary education and tertiary education is becoming increasingly regressive. In summary, over the last decade while Colombia enjoyed clear improvements in educational attainment, there is an increasingly inequitable queue at the entrance to post-secondary education.

Inequality in access to tertiary schooling has a negative impact on inequality in the future in that the high pecuniary gains from tertiary education translate into high income inequality later between those who have tertiary education and those who do not. Improving access to Tertiary Education for lower and middle-income groups is therefore an important remedy to mitigate future inequalities.

Female Students Outnumber Males

Tertiary Education is pro-gender implying that the system actually corrects societal inequalities. Colombian women tend to enroll in greater numbers than men, perform better than their male counterparts, and graduate at higher rates. Currently, 52 out of 100 students enrolling in tertiary education are female.[4] Moreover females are more likely to complete their studies. The gender difference in completion rates is around 10 percentage points. For example, for the cohort starting in 1995, 53 percent of the women graduated while only 43 percent of their male colleagues completed their studies.[5]

4. A similar majority of females is found in many other middle-income countries.

5. Calculation assumes it takes five years to finish a degree program. The differences in attendance and completion rate between the genders translate into reduced income inequality. Angel-Urdinola (2002) confirms that education significantly reduces the gender gap in wage. In accordance with the overall finding, he finds that the wage gap between the sexes for workers with Tertiary Education is the smallest.

TABLE 2: TERTIARY EDUCATION INSTITUTIONS IN COLOMBIA, BY LEGAL STATUS

Legal Status of Institution	Number of institutions (2002)	Enrollment (2000)	% of total enrollment	Graduates (1999)
Universities	105	640,088	69	71,990
University Institutions	88	188,885	20	17,876
Technological Institutions	60	67,350	7	10,046
Technical Training Institutions	52	37,762	4	6,843
Total	**305**	**934,085**	**100**	**106,755**

Source: ICFES

When examining what women study, it is found that true to their counterparts around the globe, most women study in traditional fields. Of total enrollments in 1999, women were dispersed as follows: 34 percent in Economics, Administration and Accountancy, 19 percent in Engineering, 15 percent in Social Sciences and Law, 16 percent in Education, 11 percent in Health sciences, 2.1 percent in Mathematics and the Natural Sciences, 2.2 percent in Fine arts and 1.1 percent in the Agricultural sciences. The remaining 0.4 percent were enrolled in Humanity and religion.

The Providers

Legal Status of Providing Institutions

The law governing Tertiary Education classifies Tertiary Education institutions and their missions into four categories[6]:

- ***Universities,*** carry out the traditional missions of teaching and research at the graduate and undergraduate levels,
- ***University Institutions,*** *Instituciones Universitarias,* or *Escuelas Tecnológicas,* are tertiary institutions whose main mission is teaching academic disciplines of high specialization,
- ***Technological Institutions,*** *Instituciones Tecnológicas,* focus on short-term, academic education in technological fields,[7] and;
- ***Technical Training Institutions,*** *Instituciones Técnicas Profesionales,* provide short-term vocational education and training and skill upgrading at the tertiary level.

Table 2 presents the four kinds of providers and their respective shares of enrollment. The sector is comprised of 305 tertiary institutions, of which 193 operate under the law as universities or university institutes and 112 are classified as technological and technical institutions.[8]

The majority of students enrolled in Tertiary Education, 89 percent, attend universities and university institutions with the remaining 11 percent enrolled in technological and technical training institutions. Based on Table 2 it is seen that the average size of Tertiary Education institutions is quite small. Most universities enroll on average about 5,000 students while university institutions enroll about 2,200 students. The technological and technical institutions are even smaller with average enrollments of 1,000 and 625 students respectively. The small size of institutions may be cause

6. Article 16 of *Ley 30* from 1992 defines the characteristics and missions.

7. Ley 115, articulo 215, recognized the Technological Institutions in 1994 as belonging to the Tertiary Education sector.

8. Technological and technical institutions first appear in the official statistical yearbook in 1960. Until 1970, only 7 existed but their popularity spread swiftly during the 1990s.

to think about consolidating some institutions to allow for greater efficiency in the sub-sector and avoid the unnecessary duplication of programs, services and administration.

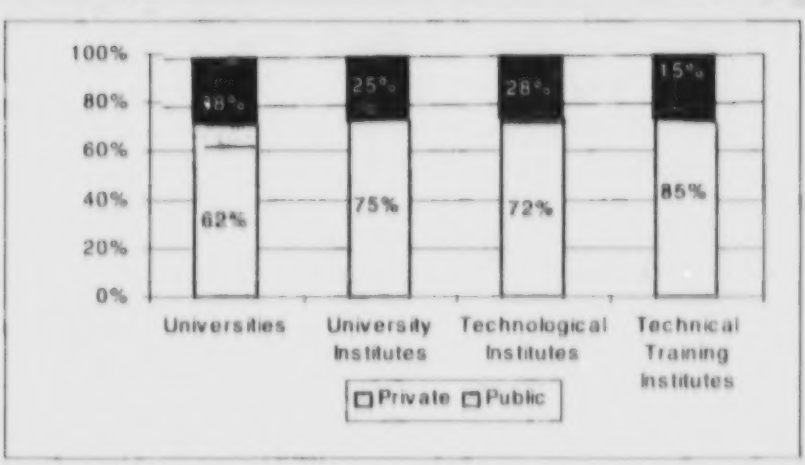
The Colombian Tertiary Education system is fairly diverse in that it consists of both public and private institutions in both university and non-university institutions. Diversity of the sub sector is important in enabling choice and in developing responsiveness to varying needs and circumstances. While the universities serve as teaching institutions, providing undergraduate, graduate, and professional degrees in a variety of disciplines and fields, they also have a sense of responsibility for the public good, such as serving the local community and providing basic research useful to their field and/or their country. Non-university institutions complement universities in that they can provide courses that respond flexibly to the demands of the labor market and courses may be shorter in duration, lower in program costs, and have lower per student costs. What is needed in Colombia is a coordinated national system of Tertiary Education in which institutions develop distinctive missions and are innovative in teaching, research and the delivery of services and in which students can flexibly change programs by transferring credits among fields and institutions.

Enrollment in the private sector dominates all types of tertiary education institutions. However, apart from the well-established, high quality private universities, it appears that many private providers focus on offering short-term courses requiring relatively light investments.

Transfer of Credit Between Providers

Until 2002, there existed no system of credit transfer in Colombia to allow students to gradually progress up the education ladder. However, the diversification of the tertiary education landscape creates the need for flexibility in the flow of students between education institutions. Many individuals do not have the time, the resources and/or the conviction to undertake a long academic education immediately after secondary education and therefore opt for short-term tertiary education. For these graduates to progress up the education ladder and acquire more education or update existing skills and knowledge, the relevant education attained in short term courses needs to be recognized in other types of education institutions. A credit-transfer system and a culture of credit-recognition

FIGURE 4: PRIVATE SECTOR SHARE INCREASES WITH LEVEL OF SKILL-ORIENTATION
(Ownership, Legal Status of Institutions, 1998)



Source: ICFES *Estadísticas de la Educación Superior* 1998
Note: Based on enrollment.

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is therefore crucial for enhancing the value of short and medium term education as well as spur enrolment in both short-term courses and long term courses, which would lead to a culture of life-long-learning. With the passage of Decree 808, 2002 on credit transfer, the government seeks to facilitate the transfer of credit and allow students to flow more easily between institutions. The decree defines one credit as 48 hours of work taken by a student, either in class or outside of class, during a semester. Since a regular semester has 16 weeks of academic activity, one credit is equivalent to 3 hours of academic work by the student per week.

In light of its recent introduction, the impact of the decree is unknown. The decree can be an important first step in the creation of a culture of credit-transfer, in which an institution recognizes the quality of instruction in other types of tertiary education. However, given the wide gaps in quality and the vast array of disciplines in the Colombian tertiary education system, it is uncertain whether a mathematical formula alone is sufficient to assure transfer between institutions. Promoting a culture of acceptance for credit transfer is key and would be in the interest of all participants, institutions and the society. Individuals who have less time and resources to undertake a full time, five-year academic education, such as students from low and middle income backgrounds and those students who must work, would especially benefit from a credit transfer system.

System Governance and Management

The current regulatory framework is a blend of the old school of thought, in which the role of the government was to control tertiary institutions, and the new school, which supports autonomy with accountability in universities and government regulation and oversight of non-university institutions. Within this framework, providing policies that assure student access and retention are the State's primary role. *Ley 30 de Educación Superior* has done just that as Colombia's Tertiary Education system evolved from an elite to a more inclusive system. In addition, The Constitution of the Republic of Colombia (1991) recognizes the importance of the freedoms of teaching, learning, and research (Article 68) and guarantees Tertiary Education institutions the autonomy to:

- Construct their institutional charters and define the institution's purposes and goals;
- Create and administer academic programs;
- Administer resources to accomplish the institutions' social and institutional functions;
- Select faculty;
- Design and develop curricula; and
- Design and implement appropriate research projects.

Compared to other countries in the region, Colombia has a fairly large number of government departments and agencies guiding and regulating the Tertiary Education system, however, they have not yielded a well-articulated governance system. Some governance problems facing the Tertiary Education sector are:

Regulatory bodies with overlapping functions. The Ministry of Education (MEN) is responsible for overall sub-sector planning, inspection, and supervision; policy design and sub-sector regulation are carried out by the MEN in concert with the *Consejo Nacional de Educación Superior* (CESU) and the *Comisión Nacional de Doctorados y Maestrías* (CNDM); the development of Tertiary Education is the responsibility of *Instituto Colombiano para la Fomento de la Educación Superior* (ICFES) and *Fondo de Desarrollo de Educación Superior* (FODESEP); issues pertaining to quality assurance are the domain of the *Consejo Nacional de Acreditación* (CNA) and ICFES for undergraduate programs and institutions, and the CNDM for graduate programs; finally, the provision of student loans is carried out by *Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior* (ICETEX). A review of the regulatory agencies involved in Tertiary Education, their functions, and their legal foundations is presented in Table 3.[9]

9. ICFES, Nuevo Compendio de Normas sobre la Educación Superior, Pacheco, Ivan F. Bogotá, October 2001.

TABLE 3: INSTITUTIONS BY FUNCTION, LEGAL NATURE AND REGULATORY FRAMEWORK

Name	Functions	Legal nature
MEN Tertiary Education Division (DES)	☐ Guides and directs policies, plans and programs for the development of Tertiary Education. ☐ Guides and directs regulation of the service and technical criteria for presentation. ☐ Directs relations with regional agencies. ☐ Directs relations with other sectors. ☐ Decides on issues, institutions, inspection and supervision. ☐ Coordinates participation and representation in international matters. ☐ Appoints secretarial officers for international organizations. ☐ Structures draft legislation. ☐ Defines criteria for the allocation of sector resources. ☐ Organizes teams to work on sector matters.	The Minister, along with the President, is the administrative authority established by law.
CESU	☐ A technical, non-political agency that plans, coordinates, makes recommendations and serves in an advisory capacity to MEN. Specifically, CESU: ☐ Sets policies and plans, ☐ Recommends general standards and procedures, and ☐ Proposes mechanisms to evaluate the academic quality of institutions and programs.	A senior academic advisory body, accountable to MEN.
CNA	☐ Quality control: Through accreditation, the CNA's role is to ensure that institutions meet the highest quality requirements and fulfills their stated objectives.	Advisory body attached to CESU
CNDM	☐ Advises CESU on: ☐ Policies and plans to create doctoral programs, ☐ Criteria for accreditation of graduate programs, and ☐ Criteria for national and international cooperation.	Advisory body attached to CESU
ICFES	☐ Executes government policies and decisions on Tertiary Education matters and acts as secretariat for CESU. ☐ Serves as an information and documentation center.	State Agency accountable to MEN; its main functions are to: –Encourage, monitor, and supervise HEI's, –Implement and evaluate policies in an effort to consolidate the Tertiary

(continued)

TABLE 3. INSTITUTIONS BY FUNCTION, LEGAL NATURE AND REGULATORY FRAMEWORK (*Continued*)

Name	Functions	Legal nature
	☐ Supports and undertakes research and studies on quality, relevance and coverage. ☐ Encourages cooperation between institutions and the international community. ☐ Develops self-evaluation processes for institutions and academic programs. ☐ Encourages training for teachers, researchers, managers and administrators; Cooperates in inspection and supervision. ☐ Provides public registration of education establishments. ☐ Advises and supports academic, legal, administrative and financial aspects of institutions in the system. ☐ Supports and develops activities which enable the Regional Committees to function. ☐ Cooperates in the organization and functioning of SUE. Supports CNA, CNDM and the Consultative Commission for Tertiary Education Institutions.[10] ☐ Accepts and validates foreign degrees. ☐ Holds State examinations and publishes results, giving the public the opportunity to exercise social control over education quality.	Education system, and support growth with quality.
FODESEP	☐ Provides financial support to institutional development through financing scientific, academic and administrative projects, infrastructure improvement, and equipment purchases. ☐ Acts as a financial intermediary between institutions and the financial system. ☐ Manages project funds for institutional projects. ☐ Ensures that institutions share resources, information, academic formation etc.	Mixed economy agency attached to MEN, organized on the principles of economic solidarity.

(*continued*)

10. Comisión Consultiva de Instituciones de Educación Superior, consists of five members from academia and serves as a consultative body to the Ministry of Education in matters related to the creation of new Tertiary Education institutions, the opening by existing institutions of branches, or Seccionales, in other cities, and the transformation of technical and technological institutions into university institutes.

TABLE 3: INSTITUTIONS BY FUNCTION, LEGAL NATURE AND REGULATORY FRAMEWORK (*Continued*)

Name	Functions	Legal nature
	■ Supports and promotes local, Departmental, regional and national integration of Tertiary Education institutions and development of cooperation programs between them and institutions abroad. ■ Takes in funds from members and grants loans. ■ Provides technical assistance services to members.	
ICETEX	■ Provides and maintains funding for student matriculation and upkeep through the provision of student loans. ■ Guarantees loans of the financial sector to poor students. ■ Selects beneficiaries for international cooperation scholarships.	State agency attached to MEN

A careful read of Table 3 illustrates the overlap in the functions of the regulatory bodies, resulting in a lack of clarity in the roles of the various agencies, duplication of responsibilities, and some tension between the governing organizations, as well as some confusion on the part of Tertiary Education institutions. For example, both DES and ICFES are responsible for overall sector development, policy design, and for the support and production of sector studies. There is also overlap between ICFES and the CNA with respect to ensuring the quality of study programs. These are only two examples of the many overlaps. In addition, there is a tendency to create additional institutions or mechanisms to address new problems, rather than reform the existing institutional structure. For example, even though the CESU is responsible by law for overseeing the performance of Tertiary Education institutions, a special Inspection Commission was established in 2000 to control and sanction poorly performing universities.

Another concern involves how the members of these policy-making and oversight organizations are selected. While these boards make a large number of decisions regarding the development of the sector, selection of members lacks transparency, is not criteria based, and is often politically motivated. For example, the CNA is composed of academicians with no political ties, but members are appointed to their posts by CESU, which is a political organization with specific political interests.

Lack of a coherent sector plan. One of the greatest obstacles to effective management in Colombia has been the lack of a clear and transparent vision for Tertiary Education with targets and performance indicators to guide sector development. This, despite several attempts by successive governments to develop a long-term vision for the future of Tertiary Education (Committee of the 40 Wise Persons, "Sintegración" etc.). The lack of planning spills over into academic programs, and the number and the geographical location of tertiary education institutions, resulting in the proliferation of similar disciplines, insufficient graduates from technologically oriented programs, and a major concentration of institutions in Bogotá, Medellin and Cali. Additionally, the election of Rectors, who may serve only a limited number of years, introduces incentives that inhibit the capacity to innovate and undertake meaningful reforms in response to changes in the tertiary education environment.

Quality Assurance

Many countries that have experienced a doubling or tripling of tertiary enrollments in the last few decades, along with increased participation rates for young people, have concurrently experienced the negative effects of rapid expansion on quality. As a result, issues of quality assurance and quality enhancement have been a major focus of attention (El-Khawas et al., 1999). Despite differences in the size and stage of development of their tertiary education sectors, many governments have decided that traditional academic controls are inadequate to deal with today's challenges and that more explicit quality assurance systems are needed. There are wide differences among countries in their approaches to quality promotion. Some governments have taken steps to strengthen quality by introducing new reporting requirements or other mechanisms of management control. In Argentina, for example, the authorities have introduced quality assurance mechanisms that depend on enhanced information and evaluation system and new rules for funding public universities. Many countries have developed accreditation systems, while others have established evaluation committees or agencies that carry out external reviews. In many cases, independent bodies have been established. While the most common set-up is a single national agency, some countries, for example the Netherlands, Mexico and Romania, operate separate agencies that are responsible for different types of institutions, regions, or purposes.

The second important dimension of government intervention is the creation of a regulatory environment, which encourages, rather than stifles, initiatives and innovations at the level of individual institutions. Key dimensions of regulation of the tertiary education sector are the legislative framework governing the establishment of new institutions, especially private universities, the quality assurance mechanisms for all types of institutions, the administrative and financial rules and controls to which public institutions are required to conform, and intellectual property rights legislation.

In countries with limited public resources to sustain the expansion of tertiary education, private provision can increase educational opportunities at little or no direct public cost. Governments can encourage the growth of quality private tertiary education institutions as a means of increasing the diversity of program offerings and broadening social participation. For this to happen, it is important to remove the cumbersome administrative requirements, which constitute entry barriers in countries with little tradition of private tertiary education.[11] Countries should aim for straightforward licensing procedures with minimum safety and educational requirements, complemented by effective quality assurance mechanisms focusing on the outputs of the new institutions.

Overview of the System

Colombia is no exception to this development. It has experienced rapid expansion and faced concerns about declining quality. In the last five years, stakeholders have, on a continual and widespread basis, discussed quality assurance. There are now a number of government agencies involved in the quality assurance system for Tertiary Education in Colombia. The Ministerio de Educación Nacional (MEN) and the Dirección de Educación Superior (DES) regulate Tertiary Education through formulating policies, plans, programs, and objectives for the sub-sector. The Ministry of Education, in conjunction with the Ministry of Finance and Public Credit and the Department of National Planning (DNP), determine the size and allocation mechanism of public funding to the Tertiary Education sector.[12] In addition, the following agencies also have a role in the quality assurance system in Colombia:

11. In Spain, private universities need to comply with a series of stringent rules regarding, among other aspects, the number of academic programs offered, the student/teacher ratio, the proportion of full-time professors, their academic qualifications, etc. By contrast, in Chile the only requirement for a new university to start operating is to get its curriculum plans and programs approved by an examining public university.

12. The Ministry of Finance and the Ministry of Education have some legal restriction on their allocation powers because Article 86 of Law 30, enacted in 1992, requires that the allocation of funding to state universities from the national and territorial budgets be above that of 1993 in constant pesos.

- *Instituto Colombiano para el Fomento de la Educación Superior (ICFES):* under the auspices of MEN, ICFES manages three regulatory related tasks with the express purpose of enhancing quality: ICFES (i) supervises Tertiary Education institutions and assures that they operate in compliance with the objectives set out in the regulations; (ii) collects, analyzes, and disseminates information concerning Tertiary Education via the National Tertiary Education Information System[13]; and (iii) supports the Ministry and the Consultative Commission in the accreditation and approval process of teaching institutions through *Acreditación Previa* (see the section on *Quality Assurance of Undergraduate Progams*, para. 36, for information on *Acreditación Previa*).
- ICFES designed and is responsible for administering a national exam, the "ICFES Exam" which is widely used by institutions in the selection of students to Tertiary Education. When developed in 1968 as a voluntary exam, any Colombian high school graduate who wished to be admitted to a Colombian university could sit for the exam in any city. In 1980, the exam was revised and made mandatory for admission to Tertiary Education (Law 81, 1980). The "ICFES exam" serves a dual role. First, as noted, it is used as an admissions tool by Tertiary Education institutions in judging the quality of its applicants (although, some universities continue to require their own admission test as well); second, it serves as an exit exam from secondary school and as an evaluative tool of the quality of those schools. As such, it provides the MEN with information about the effectiveness of secondary schooling in the country and informs policy formulation and decision making aimed at interventions to improve teaching and learning at the secondary level.
- Beginning with the 2001 academic year, ICFES initiated a national graduation exam for students completing Tertiary Education. The *Exámenes de Calidad de la Educación Superior*, or ECES, was given to students in health and mechanical engineering study programs. The tests were carried out on a voluntary basis, for both the institutions and the students, but it is envisioned that within the next few years, testing will be made mandatory. Furthermore, ICFES plans to extend the coverage of the ECES to include other fields. This approach has proven very instrumental for quality assurance in other countries. For example, in Brazil, the Provão, or the National Evaluation of Undergraduate Programs, is a successful institutional self evaluation instrument that was introduced in 1995.
- ICFES manages the National Tertiary Education Information System (SNIES). The purpose of the SNIES is to collect information on Tertiary Education institutions, such as programs offered, number of teachers, courses in a program, etc. However, its main function seems to be in the registration of programs. Before a program can operate in an institution, it must register with the SNIES and meet some basic minimum requirements. There were problems in the past with the registration of programs. For example, programs would be registered but not offered, or they operated without meeting the minimum requirements. Currently, ICFES verifies that the information provided by the institution is accurate before it is registered. Registration is not an actual quality assurance mechanism, but rather an information system providing information on a variety of inputs such as teacher-student ratios, teacher qualifications and type of course offerings. Nevertheless, insofar as it is intended to keep out of the register those programs that do not comply with minimum requirements, it can operate as a basic measure of initial quality (in terms of availability of necessary inputs). For this to operate properly, it is essential that ICFES has the ability to check on the accuracy of the information provided at the moment of registration.
- *Consejo Nacional de Educación Superior (CESU):* CESU, under the umbrella of ICFES, proposes policies and plans to the MEN to develop Tertiary Education regulations, procedures, and mechanisms to evaluate the quality of Tertiary Education.

13. Pursuant to *Decreto* 2662 of 1999, the first two roles have been expanded from focusing exclusively on Tertiary Education to focusing on secondary education as well.

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TABLE 4: COLOMBIAN QA MECHANISMS BY UNIT OF ANALYSIS AND STAGE OF DEVELOPMENT

	Institutions	Programs (undergraduate)	Programs (graduate)	Students
Opening—Initial assessment	Advice provided to the MEN by Comisión Consultiva de IES	Registration (by ICFES)	Evaluation for opening programs (by CNDM)	Examen ICFES (admission) (by ICFES)
Supervision	Inspección total (by ICFES)	Minimum standards/ Acreditación Previa (CNA and ICFES)	Follow up of existing programs (by CNDM)	(Exams and evaluations within HE institutions)
Accreditation	Evaluation of prior conditions (by CNA, before accreditation)	High Quality Accreditation (by CNA)		ECES (outcomes) (by ICFES)
Information	Information (by ICFES—NHEIS)	Information (by ICFES—NHEIS)	International exchange (by CNDM)	

- *Comisión Consultiva de Instituciones de Educación Superior*.[14] The recently created Commission, consisting of five members from academia, serves as a consultative body to the Ministry of Education in matters related to the creation of new Tertiary Education institutions, the opening by existing institutions of branches, or Seccionales, in other cities, and the transformation of technical and technological institutions into university institutes.
- *Consejo Nacional de Acreditación (CNA)*.[15] The Counsel, consisting of seven members from academia, is responsible for the design and approval of accreditation mechanisms of Tertiary Education programs. It was established with the approval of ICFES and is under the auspices of the *Consejo Nacional de Educación Superior (CESU)*. The CNA determines the conditions of accreditation, currently centered upon self-evaluation and quality, which a program must comply with in order to obtain accreditation. All types of tertiary institutions—universities, university institutes, technical training institutions and technological institutions—may apply for "Accreditation of Excellence." As of February 2002, 110 programs (56 programs in 9 public institutions and 54 programs 16 private institutions) were accredited and an additional 303 programs in 74 institutions have begun the accreditation process. Assuming all of these programs receive accreditation, that would mean a total of 413 programs, or just over eight percent of programs, will be accredited.
- *Comisión Nacional de Doctorados y Maestrías (CNDM)*. The Commission, created in 1994 by *Decreto 2791*, is under the umbrella of ICFES and composed of 5 academics appointed by CESU and an observer from ICFES. CNDM members evaluate and approve applicants from institutions seeking to establish or continue to operate a Master or PhD program. The CNDM also has the responsibility of establishing and maintaining links with foreign universities to stimulate international exchange and promote international contacts.

Applied Quality Assurance Mechanisms

There are a number of mechanisms that comprise the regulation system in Colombia, several of which can also be included in a global definition of quality assurance. Some of them apply to institutions, some to programs (both undergraduate and graduate) and some to individuals. In the

14. Established in accordance with *Decreto 1176*, June 1999.
15. Established by the passing of *Ley 30* of 1992.

table that follows can be seen an approximation to these, organized in terms of the unit of assessment, plus the moment in which they are evaluated (prior to opening or during their operation).

As can be seen, there are a number of different mechanisms, all trying to ensure quality in some aspect of Colombian Tertiary Education. Not all of them can be considered strictly quality assurance mechanisms by international standards, but since all of them have a role to play, they shall be analyzed in the following section. The main body appears to be ICFES, which carries out most of the regulatory actions but is not publicly acknowledged as a quality assurance agency—a task attributed to CNA and CNDM, both of which have a limited and narrowly defined role within the system.

Since the main focus of quality assurance is at the undergraduate program level, this will be examined in the following section. For a look at quality assurance mechanisms at the institutional and graduate program level of analysis, the reader is directed to Volume II, study 5.

Quality Assurance of Undergraduate Programs

Opening. Registration of programs began in 1990. To offer a program, an institution must register that program with ICFES and show that it meets some basic standards for operation. Requirements are minimal but include information about the number of teachers, their qualifications, available space, etc. Once registered, the program receives a registration number and is included in the SNIES database. If an institution has already registered a program, but wants to offer it in a different mode or different location, it must be registered again, providing the necessary information pertaining to the new offering. Program registration is required and non-compliance with registration procedures can lead to serious consequences.[16] In 1990, 1,809 Tertiary Education programs had been registered; by 1997, this number had grown to 2,948 programs. However, as the Colombian Tertiary Education system underwent rapid expansion, many programs began to apply for registration, placing a heavy burden on ICFES and resulting in the registration of programs that did not meet the basic minimum requirements and to the operation of unregistered programs. This led to a retooling of the registration process to make it simpler and more transparent. Still, the actual issue is the need to maintain the capability to check on the accuracy of the information provided for registration, without lowering the demands placed on institutions and programs.

Supervision. Programs in Health and Mechanical Engineering must meet recently established *Estándares Mínimos de Calidad* (Minimum Standards of Quality). These require that programs meet approximately 16 basic requirements. While Minimum Standards of Quality is similar to registration (insofar that they will eventually be applied to programs before they are operating) at present they are being applied to existing programs and more care is being taken to ensure that institutions applying for this certification actually meet the basic requirements. Meeting the Minimum Standards of Quality is not voluntary. Institutions have two years in which to prove that they have met the minimum standards or they will be closed.

A mechanism similar to Minimum Standards of Quality is *Acreditación Previa,* which undergraduate and specialization programs in education have had to receive since 1998. *Acreditación Previa* was made mandatory with the passage of *Decreto 272* in 1998 in order to ensure a supply of well-trained teachers to lower levels of education. Currently, between *licenciaturas* and specializations,

16. For example, the *Universidad Antonio Nariño* was closed recently for one year for, among other things, failure to register some of its programs. While the university had registered all of its programs offered at its Bogotá location, it had failed to register programs operating at satellite locations around the country. In other words, it was using the registration numbers for its Bogotá programs in its other locations without informing ICFES that those programs were being taught at different locations, with different faculty, etc. The programs, while not technically new, were still required to register to ensure that minimum standards at these satellite locations were adequate. Upon its closure, other universities were asked by the government to accept Universidad Antonio Nariño students into their programs on a voluntary basis. Many students chose to attend other universities while some chose to remain out for the year. Tuition and fees for Antonio Nariño students remained unchanged. When the university reopens, students will be free to return to Antonio Nariño or remain at their new institution, if they are performing satisfactorily.

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Acreditación Previa has been granted to 735, or approximately one-half, of all education programs. Results are made public through posting on the National Tertiary Education Information System. To receive *Acreditación Previa*, programs are evaluated on 26 input criteria. *Acreditación Previa* is granted for seven years after which a program must show that it has received "Accreditation of Excellence" or it must go through the *Acreditación Previa* process again. The Ministry of Education may shut down any program not granted the *Acreditación Previa* if after a two year grace period, a program fails to meet the requirements. The *Consejo Nacional de Acreditación* carries out *Acreditación Previa*.

There seems to be some struggle over who should be responsible for evaluating the minimum standards of programs. The CNA is responsible for enforcing *Acreditación Previa* for education programs and carried out the evaluation of minimum standards for health and engineering programs. However, law programs will soon be added to the list of programs required to meet minimum standards and it was decided, much to the surprise of the CNA, that ICFES would carry out the evaluations. The argument ICFES is using to justify this move hinges on the nature of the criteria used for evaluation. The requirements are viewed as not being strictly quality criteria, but are classified as "control" mechanisms, and it is for this reason that enforcing Minimum Standards of Quality could be shifted from the CNA to ICFES.

Accreditation. The *Consejo Nacional de Acreditación* has the sole responsibility of carrying out "Accreditation of Excellence" (as mandated in Law 30, 1992), the primary component of the quality assurance system in Tertiary Education. The process of accreditation in Colombia is similar to that in many other countries—self-evaluation by the institution, based on standards adopted by the accrediting agency, a site visit by a group of peer reviewers, and recommendations to, and decision-making by, the accrediting agency. According to the regulations governing accreditation, the legal representative of a Tertiary Education institution seeking voluntary accreditation of its academic programs needs to submit a written application to the CNA expressing the desire to accredit one or more programs. CNA assesses the eligibility of the institution through the process of "evaluation of prior conditions" (see Vol. II, study 5). Accreditation is voluntary and is available to all types of Tertiary Education institutions.

For accreditation to work properly and achieve its objectives, it must be a cooperative enterprise among institutions and accreditors. Cooperation is not likely without good coordination and communication.[17] Apparently, the institutions trust the CNA because it is a body comprised of academics, not politicians. There are seven academics who serve for five years each on a rotating basis. The rotation of CNA Board members is healthy for the functioning of the organization because this practice endows the Board, and the organization, with an institutional memory that does not exist in other entities due to their political affiliations.[18] Board members meet two to three times a month to carry out the business of the CNA. Another practice that adds to their credibility with the institutions is that peers who volunteer their time to the accreditation process carry out the accreditation review. According to recent CNA data, there are 2000 national peer reviewers and 500 international peer reviewers participating in the accreditation process. Obviously, not all of the reviewers are available all of the time. Accreditation is granted for a period of time, typically between two to five years. After the initial accreditation period, programs wishing to retain their accreditation need to reapply to the CNA for accreditation to maintain accredited status. As is the case with institutions, ICFES through SNIES provides information on accredited programs to all relevant stakeholders.

17. Glidden, Robert. 1996. Accreditation at a Crossroads, *Much is at stake as the newly formed Council for Tertiary Education Accreditation begins its work*. From Educational Record, fall 1996. Published by American Council on Education (Special Annual Meeting Issue).

18. Board members serve five year terms. Of the first seven members appointed, three were rotated out after two-and-one-half years and replaced with new members. Of the four remaining original members, two were rotated out at the end of their term, leaving two original members who will serve an additional 2.5 years. In this way, there is always someone on the Board who knows what is going on within the organization.

An Analysis of the QA System

Issues in the Quality Assurance Process: The accreditation system in Colombia has had positive impacts on the Tertiary Education sector. It has stimulated improvements in the programs and in the institutions that have participated. Nevertheless, there is still concern that the quality of education has declined in recent years and has become less relevant in the new knowledge-based, global economy. There is also concern about access, and the need to improve equity without threatening the quality of programs.

The government recognizes the role accreditation plays in quality improvement and is continuing to revise and improve its quality assurance system. Still, there are indications that point to some underlying problems:

- In the first place, the number of accredited programs is quite small. One reason for this may be that the standards set for accreditation are too burdensome and that institutions lack the necessary resources to meet accreditation standards. Then, the question is whether other measures and actions should be taken to help institutions to prepare for accreditation, but it would seem imprudent on the part of the CNA to lower quality standards in order to allow more programs to acquire accreditation. Another possible reason may be that accreditation is defined as 'Accreditation for excellence' or 'High Quality accreditation,' meaning that CNA is looking for programs that can be described as models for other similar or equivalent ones. If this were the case, then the obvious result of such an approach would be a small number of accredited programs, as 'excellence' is, by definition, scarce. The question, then, is whether this scheme is effective in terms of assuring adequate levels of quality, albeit not excellent ones.
- Secondly, there seem to be many institutions doing similar things, or the same institution attempting to carry out many different functions. In the first case, both CNA and ICFES are engaged (or will be shortly) in evaluating for *Estándares Mínimos* in different areas (CNA in education as acreditación previa and then as registro calificado for health and mechanical engineering, ICFES for law). In the second, ICFES is responsible for program registration, institutional inspection, assessment of minimum standards in the case of law studies, administering the ICFES exam for admission to Tertiary Education and the ECES or exams for graduates. It is very difficult for one institution to organize for such different activities, and this may be the reason for some of these activities being carried out more formally than substantially. This is something that must be looked into carefully, as it seems the logical outcome of a system that has been growing in response to diverse needs and demands, without having the time or the resources to organize it functionally and organizationally.

Strength of the Quality Assurance System in Colombia. The primary strength of the Colombian QA system—as, paradoxically, one of its important weaknesses—lies in its mixed character. It covers everything: institutions, undergraduate and graduate programs, and individuals. It attempts to do everything: ensure starting conditions, compliance with minimum standards, and guarantee high quality. In this sense, it has shown the Tertiary Education system that quality is a primary concern for Colombian society, and that quality must be assessed and ensured even before an institution or program begins operation. The weak side of this comprehensiveness is that it is usually very difficult to be able to carry out all these different reviews, which demand different approaches, with the limited resources available to developing countries.

Maybe the most interesting development has been the establishment of CNA and the introduction of its high quality accreditation system. Its strength probably lies in its focus on program accreditation. Systems that focus on accrediting institutions rely on the background and training of the institutions' human resources as an assurance of quality. Many working in the area of Tertiary Education reform recognize that an institution's ability to monitor its own teaching and learning processes are key to attaining and maintaining quality. To carry out these monitoring activities presupposes a

well-trained faculty that can develop appropriate curricula and determine the elements necessary for quality programs, and qualified institutional administrators or managers. Given the small percentage of Colombian faculty holding PhD (2.2% of Professors and 1.7% of *Plazas Docentes*) and Master degrees (13.8% of Professors and 13.3% of *Plazas Docentes*) many institutions may not have the capacity to assure quality in program development.[19] In any case, to develop adequate institutional capacity for quality assurance requires explicit and definite policy mechanisms, which take much longer and have not been developed until now in Colombia. Therefore, program accreditation focusing on curriculum and other elements necessary for quality, is appropriate, (Phelps, 2001). Given the limited magnitude of graduate programs in Colombia, 1999 saw only 16 graduates receive PhDs and 2,113 receive Master's degrees, future staffing needs are unlikely to be filled with faculty members holding this level of post-graduate education. The dearth of graduates with advanced degrees could further reduce the quality of teaching and research and hamper accreditation.

Another strength of program accreditation is that it better meets the needs of developing institutions. It allows institutions to strive for quality by reducing the substantial tasks involved in institutional accreditation, into more manageable "units," thus improving the chances of attaining quality. Institutions can allocate their scarce resources to improving the quality of programs one at a time. Additionally, if accreditation status is publicized, program accreditation also informs the choices made by students and their families when selecting a program at a particular institution. Generally speaking, systems that have had accreditation mechanisms in place for decades are better positioned to use accreditation to build institutional capacity and to sustain quality improvements (Eaton, 2001).

It is important to recognize that even though accreditation is occurring at the program level, many of the areas examined are institutional in nature (see pp. 9–10) (Phelps, 2001). Areas of evaluation such as mission, staffing requirements, administration, and facilities reflect on the quality of the institution as a whole, as well as on the program seeking accreditation. Therefore, it is conceivable that the quality of the institution increases with each program that receives accreditation. Eventually, since institutional accreditation is a goal of the Ministry of Education, institutional accreditation could begin by granting accreditation to those institutions that have a certain percentage, say 75%, of their programs accredited.

Even though program accreditation seems the right way to start developing strong quality assurance measures, the Colombian approach suggests some questions. What is really meant by 'high quality accreditation'? As mentioned before, if it means identifying and highlighting programs that can serve as models to others, it will necessarily have a limited reach—most programs are not, nor can they be expected to be, models for others. While it may be important to have excellent programs to show the way, the question remains about what will be done with programs that are not excellent, but that provide an adequate service. These cannot be accredited as 'high quality,' but should not be denied some kind of recognition. This may be what is expected from the 'minimum standards' evaluation, but in that case, it should be explicitly formulated. On the other hand, it seems peculiar that all institutions and programs are assessed against the same set of standards (factors and characteristics), whether they are universities or technical training institutions, professional or technical programs. It may be argued that the standards are applied by expert evaluators, who understand the nature of the institution or the program, but international experience makes it clear that the assessment of universities is qualitatively different from non university institutions, and that it is not simply a question of degree, but rather of assessing different things.

Improvements to Quality Assurance

What is necessary are improvements that provide some measure of organization to the different quality assurance mechanisms in place, so that institutions and their programs move along a continuum that promotes increasing levels of quality, and also an increasing sense of institutional com-

19. ICFES data; both figures are for 1999.

mitment with quality. In other words, starting with simple and supervisory mechanisms, mostly externally applied, the system should move towards accountability and finally, accreditation based on the institutions' capability to assure the quality of its programs and services.

The QA system must also support the development of the Tertiary Education system consistently with the way it is envisioned by the Government (Orozco Silva, 2001). This means, among other things, to support increasing access (which is normally linked to increased quality offerings at the technical and technological level), to ensure compliance with minimum standards for all programs offered in the country, to make programs more pertinent to actual stakeholder needs, to increase links with the productive sector, and to continue to move the tertiary education system towards international standards (A background study to this report, DePietro-Jurand and Lemaitre, 2002, elaborates further recommendations for the quality assurance system).

Academic Personnel

Qualifications

Educational qualifications of the academic staff have improved over the last 14 years. In 1986, four out of five teachers held only a graduate diploma as the highest academic distinction.[20] By 1999, nine out of ten teachers had graduate credentials. Furthermore, in the same time period, the proportion of academic staff with Doctorates increased by 21 percent. While the growth in the number of staff with PhDs seems impressive, in reality the proportion of PhDs among the academic staff at universities is only two percent and has remained stable since 1994. Given the limited magnitude of PhD programs in Colombia—discussed below—future staffing needs are unlikely to be filled with faculty members holding this level of post-graduate education. The system could face a crisis in terms of meeting their staffing needs with adequately qualified academics. Ultimately, this could reduce the quality of teaching and research.

Student-Teacher Ratio

State universities had very few full-time faculty members before 1960 but between 1960–1980 the number of faculty increased by a factor of twelve. Over the same time period, the student to full-time faculty ratio remained constant at 12, a rather low figure given that the workload of part-time faculty members is included. Hereafter, the number of full-time faculty increased by 8 percent, while the student population grew almost 15 percent resulting in a student to full-time faculty ratio of 25. Without taking into account the part-time status of faculty members, the calculated student-faculty ratio for 1997 was 17. This ratio is rather low for faculty members who have reduced research obligations and consulting, which might explain why many think that the state universities are affected by bureaucratization of their faculty.

In private universities, the rate of growth of full-time faculty has been greater than in public universities. Faculty numbers rose by a factor of 51 during the period 1960–1997 in private universities. However, the number of full-time faculty members in private universities has always been below that of public universities—three teachers in private universities to seven in public universities. For the period 1960–1997, there were almost eight part-time teachers for every full-time faculty member in the private sector, resulting in an average student to full-time-equivalent faculty ratio of 27.[21]

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20. Graduate diplomas is defined as *"Profesional," "Especialista," "Magister,"* and *"Doctor"* that require at least 4 years of tertiary schooling in contrast to *"Technical Profesional," "Tecnólogo"* and *"Licenciado,"* which demand less than 4 years of tertiary education. The number of full-time equivalent faculty was calculated for each year between 1960 and 1997 under the assumption that in the public university, one full-time faculty member is equivalent, with respect to teaching load, to 3 part-time faculty members.

21. This figure is based on the equivalence of four part-timers to one full-timer as a more accurate relation in the private university. This assumption could inflate the full-time-equivalent faculty since a teacher only needs to a give two courses in order to be classified as full-time. Lucio and Serrano (1992) found that for the years 1982, 1985 and 1988 the ratio of students to full-time-equivalent-faculty in the private university increased from 24 to 26, thus confirming the previous figure.

Assuming that each student takes seven courses, the average class size would be 47 students, which for part-time teachers is a very large class size. Students in classes of this size, with teachers who do not have out of classroom time for preparation and consultation, do not develop intellectual independence and play a passive role limited to note taking, memorization, and repetition, and except for a few notable exceptions most faculty in private institutions do not conduct research.

Terms of Employment in the Public Sector

Rules governing terms of faculty employment are based on Decree 1444 of Ley 30 (Chapter III, article 70). To be hired as faculty in a public Tertiary Education institution a teacher must possess a degree from a professional studies program. Competition for positions is tight and each institution determines its own hiring criteria.

There are several types of professorships: Exclusive dedication professors, Full-time professors (40 hours/week), Part-time professors, and *Catedráticos*, or contracted, hourly employees. Only the first three categories of teachers are public employees. Professors may fall into one of four categories. Listed from least senior to most senior these categories are auxiliary professor, assistant professor, associate professor and titular professor. Promotion from one level of professorship to the next is predicated on length of service to the institution and research efforts. Public universities are required to establish a "professor statute" which details the criteria that guide hiring, promotion, performance evaluation, retirement, rights and obligations, etc., of both the employees and the employer. Professors who are public employees have their salary set by the government according to a point system. Points are awarded based on the diploma received, years of experience and academic productivity, to name a few. Salaries are automatically increased every January.

Decree 1444 has been credited with stimulating scientific production and increasing the number of professors who have gone onto postgraduate studies in order to improve their salaries. Conversely, it is also blamed for starting a kind of "point war" that has devalued the profession over the years as some universities became quite flexible in awarding points just to improve teacher salaries and institutional budgets, irrespective of quality of services provided. A new decree, 2912, was approved in December 2001 in an attempt to clarify the criteria for promotion. While some in academe view the new decree as a positive step, others see it as setting restrictions on academic and scientific productivity. The result has been limited strikes on the part of faculty, bringing education to a halt for two days out of every week.

Enrollment: Unprecedented Expansion in the mid 1990s

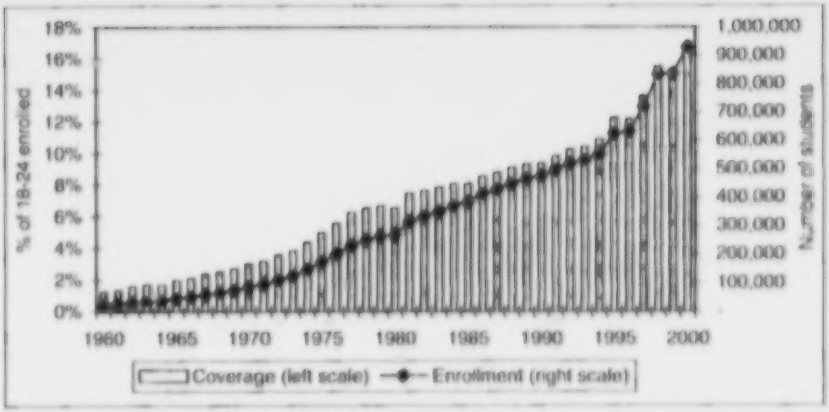
The sector underwent substantial expansion during the last half century. Figure 5 shows the growth in undergraduate enrollment from 1960 to 1999. In 1960, enrollment was only about 20,000 students. At this time, enrollment figures began to double every five years so that by 1975 enrollment stood at 176,000 students. In 1975, the establishment of the mass university encouraged further expansion of places and by 2000 total enrollment in all types of tertiary institutions stood at about 930,000 students, a forty-seven-fold increase in forty years. In particular from 1995 to 1998, conditions were favorable to expansion and the Tertiary Education sector expanded by a rate of more than 11 percent per year equivalent to the creation of approximately 70,000 new places each year. In the same period coverage increased by 1.2 percent per year.

That growth in Tertiary Education enrollment outpaced growth in the country's population implies that a larger proportion than ever of Colombian youth are attending tertiary education. Net coverage of the 18–24 year old cohort increased from nine percent to 15 percent between 1990 and 1999 (Figure 1). However, along with the rapid growth, concerns about declining quality, relevance, and equity within tertiary education surfaced.

Expansion in an International Context

While growth in the sector has been admirable, enrollment in Colombia compares unfavorably with other countries in the region. Table 5 shows that among the Latin American countries, only

FIGURE 5: ACCELERATED EXPANSION IN THE 1990S
(Growth in Enrollment and Coverage in Tertiary Education, 1960–1999)



Source: ICFES *Estadísticas de la Educación Superior* various years

TABLE 5: COLOMBIA: A HIGH PERFORMER IN THE REGION, BUT AVERAGE COMPARED TO OECD COUNTRIES
(Growth of Coverage in Tertiary Education, 1980–1997)

	% of Age Cohort in Tertiary Education		% Increase in Coverage
Country	**1980**	**1997**	**1980-1997**
Chile	12	32	167
Colombia	***6.5***	***13***	***150***
Uruguay	17	30	77
LA average	16	25	71
Argentina	22	36	64
Peru	17	26	53
Costa Rica	21	30	43
Venezuela	21	29	38
Brazil	11	15	36
México	14	16	14
OECD Countries			
Korea	15	68	353
Turkey	5	21	320
Portugal	11	39	255
United Kingdom	19	52	174
OECD Average	24	54	159
Spain	21	51	143
Norway	26	62	139
New Zealand	27	63	133

(continued)

TABLE 5: COLOMBIA: A HIGH PERFORMER IN THE REGION, BUT AVERAGE COMPARED TO OECD COUNTRIES (*Continued*)
(Growth of Coverage in Tertiary Education, 1980–1997)

Country	% of Age Cohort in Tertiary Education		% Increase in Coverage
	1980	1997	1980-1997
Finland	32	74	131
Ireland	18	41	128
France	25	51	104
Italy	27	47	74
The Netherlands	29	47	62
United States	56	81	47

Source: ICFES for Colombia and UNESCO data (1999) as reported in World Development Indicators 2001
Note: Mexico is listed with other LA country, even though it equally is member of OECD.

Brazil and Mexico have coverage rates similar to that of Colombia, while Argentina, Chile and Costa Rica lead the region in Tertiary Education enrollment. Nevertheless, the tertiary education system in Colombia has outperformed many of its neighbors in the region when it comes to the magnitude of the increase in coverage. During the last decade, coverage surged 150 percent; only Chile, through continued, proactive political and institutional reform in tertiary education, has performed better (Box 1).

Compared to OECD countries, Colombia trails considerably. On average, over half the youth in OECD countries enroll in Tertiary Education whereas in Colombia, only one in seven youth are accorded this privilege. Additionally, growth in the average OECD coverage rate, from 1980 to 1997, actually exceeded that found in Colombia with the middle-income countries of the OECD (Korea, Portugal and Turkey) expanding at phenomenal rates. The numbers underscore that reform is imperative and that often, policymakers need to pursue sweeping, and sometimes painful, reforms to avoid falling behind.

Private Sector Dominance in Enrollment

As is the case for many countries, economic constraints have limited the government's ability to fund the expansion of tertiary education. In countries with flexible education legislation, the private sector has stepped in and filled the growing demand for tertiary education. Colombia is no exception. Private institutions in Colombia have traditionally played a greater role in the sector than in most other countries resulting in a private sector that is well integrated into the overall tertiary system. Until approximately 1950, public universities enrolled over 60 percent of all undergraduate students. After that time, enrollment in private institutions began to rival that in the public institutions. Currently, the private sector captures more than two thirds of total tertiary enrollment. In 1999, the public sector enrolled over 294,000 students (about 33.5 percent of total enrollment, undergraduate and graduate) while the private sector accounted for a little over 66.5 percent of total enrollment—or just over 583,000 students.

Figure 6 shows that during the 1990's enrollment in the private sector grew at a rate of 25 percent per year, compared to an expansion rate of just 10 percent per year in the public sector. The slower growth in the public sector can be attributed to two forces: first, to the lack of resources necessary for expansion and second, to the lack of an appropriate incentive structure and an enabling policy framework governing Tertiary Education. Together, these two factors had the effect of reducing the responsiveness of public institutions.

BOX 1: TERTIARY EDUCATION REFORM IN CHILE

Chile has recently committed US$241 million to launch its second wave of Tertiary Education reforms. The new policy package, supported by the World Bank, builds upon the reforms of the early 1980s, furthering transformations that proved successful, fixing what failed to achieve its intended results and adding new dimensions to the reform effort. This case of second-wave reforms, unique in Latin America, can provide some guidance to countries in the region now embarking on first-generation reforms. First-generation reforms in Chile included: cost recovery in public universities through tuition fees and diversification of funding sources; student aid and government funding tied to institutional performance; rewards for good faculty performance and disincentives against mediocre work, evaluation systems aimed at fostering accountability and improving quality; strengthening of vocational training; institutional diversification; and privatisation, both in the sense of allowing for private provision of post-secondary education, and of increasing private-sector contributions to Tertiary Education funding.

Starting in 1981, Chile opened for diversification of its Tertiary Education system: by 1996 there were 242 private and 25 public institutions, with private enrollments at 63 percent of the total, and only one-third of the budgets of public institutions coming from government appropriations. New legislation allowed post-secondary education to diversify into three tiers (universities, professional institutes, and technical training centers) and stimulated the growth of the vocational training sector, so that by 1996 one-third of all post-secondary students were attending non-university technical or professional programs. The government has experimented with performance- and contract-based funding, and it lets universities regulate personnel issues. While public university tuition levels match those of private institutions, financial aid is available in the form of scholarships and loans. Finally, an institutional accreditation system was initiated in 1990.

After almost two decades of reform, Chilean Tertiary Education scores high relative to Latin America in efficiency, coverage, overall quality of teaching, research productivity, institutional diversification, and evaluation. However, despite successes in many areas, some difficulties remain. The second generation of reform initiatives endeavors to correct problems raised by the previous reform. Proposed remedial measures include: strengthening public funding for the improvement of teaching, research, and training of researchers, via competitive mechanisms and contracts; complementing the current institutional accreditation system with a national program evaluation scheme; and improving the capacity of public agencies to coordinate the Tertiary Education system. The unifying motive behind the reforms appears to be reclaiming a role for the state in the regulation of the Tertiary Education system in which the government will assume a much more active role in ensuring the production of public goods, setting standards for quality and monitoring their application, disseminating information, defining priorities for the allocation of funds, and ensuring that institutional commitments are honored. In a word, the state will do more to assure the accountability of the system and its component institutions to their various constituencies.

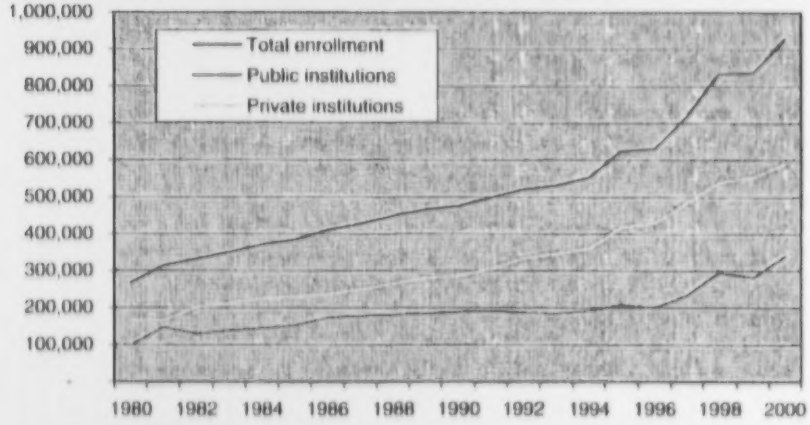
Source: Bernasconi (1999).

On an international scale, the Colombian tertiary education system figures among the countries with the highest incidence of private provision (Figure 7). Within the region, only in the Dominican Republic and in El Salvador does the private sector dominate further. However, East-Asian education systems tend to foster a substantially larger private sector, as exemplified by Japan and the Philippines where more than three out of four students attend private institutions. The high incidence of private provision, where households pay tuition and fees directly to the institution rather than through the government, is presumably one of the main factors that allowed the Colombian Tertiary Education system to expand as aggressively as it did in the 1990s. Reliance on public resources would have rendered a similar expansion impossible.

The higher incidence of private provision necessitates a sizeable transfer of funds in investment directly from the households to the providers, with the benefits accruing over a 30-year time horizon. While diversification of the sector to include private provision is a sign of its health and vibrancy, it also can pose a threat to equity and decrease investment in advanced human capital if not properly regulated.

FIGURE 6: EXPANSION LEAD BY PRIVATE SECTOR

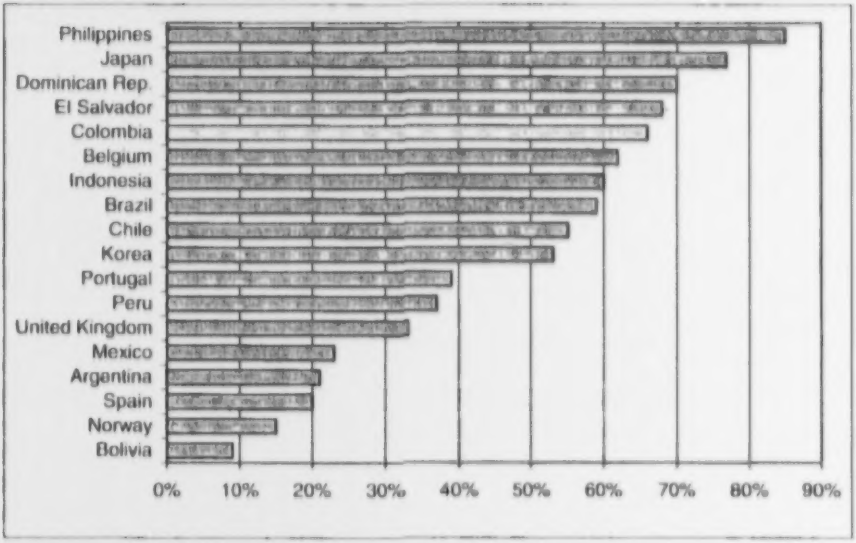
(Private and Public Enrollment, 1980–2000)



Source: ICFES *Estadísticas de la Educación Superior* various years

FIGURE 7: TERTIARY EDUCATION IN COLOMBIA IS NON-GOVERNMENTAL

(Share of Enrollment in Private Tertiary Education, as a % of total)



Source: World Bank compilation of national data.

Recent Decline in Admission to Tertiary Education

Despite the system's expansion during the 1990's the number of new entrants to tertiary education began declining in 1998. Figure 8 shows that the number of new entrants decreased from a high of 256,672 in 1997 to 207,246 in 1999, a decline of 19 percent. This amounts to a three year accumulated decline in enrollments of approximately 100,000 young Colombians. The reduced dependence in the public sector on private payments has allowed the sector to not only maintain, but to increase, enrollments by five percent over the same time period.

The decline in enrollments is in all likelihood related to the severe economic recession that struck Colombia in 1998 and still influences the economy today. The economic hardship reduced enrollment by both stifling families' ability to shoulder fees for Tertiary Education and by reducing the state's available resources for the public Tertiary Education sector. Part 2 on Economic Perspectives investigates declining enrollment in more detail.

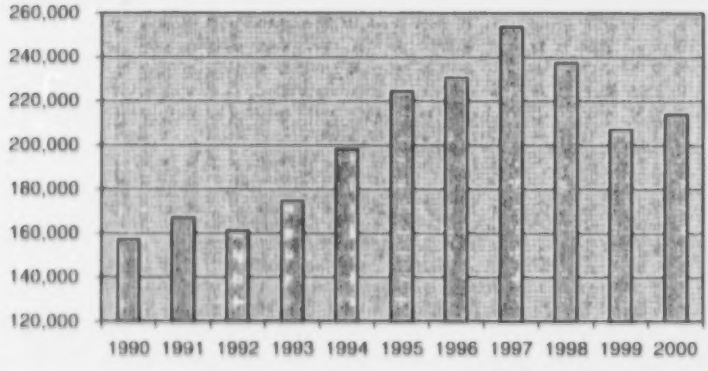
Disparities in Regional Enrollment

Enrollment by region shows some striking differences. Between 1990 and 1999, on average, 41 percent of total enrollments have been in the District Capital, 22 percent in the Central region, with the remaining evenly split between the Atlantico, Pacifico, and Oriental regions (Table 6). These differences have remained stable over time. The government has taken pains to locate tertiary institutions throughout the country to make tertiary education accessible, even in remote areas, but in general, the large urban areas are the best served. Part Two of this report shows that the public sector focuses on provision of education in low-enrollment regions.

Significant Enrollment in Evening Courses

In institutions where evening courses predominate, course offerings tend to concentrate on "softer" disciplines or professionally orientated degree programs such as teacher training, law, business, computer science and other emerging technological fields. Most courses in these institutions do not require expensive laboratory equipment, so hard sciences are under represented. Students typically opt for evening classes as a result of the need to sustain their own and their family's livelihood. Moreover,

FIGURE 8: AN ACCUMULATED DECLINE IN ENTRANTS OF 100,000 SINCE 1997
(Entrants into Tertiary Education, 1990–2000)



Source: ICFES *Estadisticas de la Educación Superior* various years

TABLE 6 COVERAGE BY REGION

Departamento	Coverage (in %)	Departamento	Coverage (in %)
Bogotá	32.9	Cauca	5.5
Atlántico	18.6	Huila	5.2
Antioquia	17.7	La Guajira	5.2
Santander	14.4	Cesar	4.9
Valle	11.9	San Andrés	4.8
Caldas	11.0	Sucre	4.8
Norte Santander	10.6	Nariño	4.2
Quindío	10.1	Meta	3.9
Boyacá	9.0	Cundinamarca	3.4
Bolívar	7.8	Magdalena	3.4
Tolima	7.7	Caquetá	2.6
Risaralda	6.9	Putumayo	0.5
Choco	5.6	Amazonas	0.0
Córdoba	5.6	Casanare	0.0
National average			13.2

Source: ICFES

Note: Coverage is calculated relative to the age-cohort 17–24, as opposed to 18–24 used elsewhere in this report. The shown national average therefore lies below the one presented previously.

as Part Two of this study will show, evening courses are less expensive than full-time day enrollment. While evening classes allow working individuals to attend tertiary studies, it also results in reduced effort and time devoted to learning, leading to lower quality and value added of the human capital generated. The rate of participation in distance education is small, at just a little under nine percent of total enrollments. Here, public institutions account for a somewhat larger share of the enrollments.

High Graduation Rate

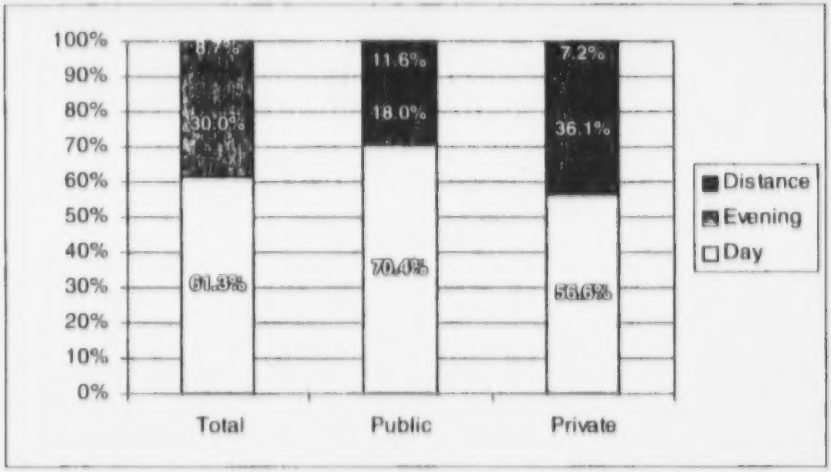
The Colombian tertiary education system appears efficient in its ability to educate enrolled students into graduates. Over the last decade, less than 4 percent of the student population exited prematurely the system every semester. Moreover, the students seem to avoid repetition and hence graduate within an acceptable time. On average, 14 percent of the enrolled students graduate every year. The rate resembles the typical graduation rate found in both OECD and Latin American countries. The OECD average is 12 percent and in Brazil less than 13 percent graduate while less than 8 percent complete per year in Argentina.[22] Although these calculations are based on national aggregates, they suggest that the system is successful in turning students into graduates for the benefit of the students, providers and society.

Disciplines: Under-Investment in Technical Education

As shown in Figure 9, all fields experienced rising enrollments except the agricultural sciences. The largest gains in enrollment were made in Economics, Administration and Accountancy, and Social Science, Law, and Politics which more than doubled over the decade. Gains in Mathematics and

22. Source: For Colombia: World Bank Staff calculations based on national enrollment and graduate data from SNIES, ICFES. For comparable statistics: OECD and FIEL cited in Del Bello (2002) "*Desafíos de la política de educación superior en America Latina: Reflexiones a partir del caso argentino con énfasis sobre la evaluación para el mejoramiento de la calidad*," World Bank LCSHD Discussion Paper, Washington DC.

FIGURE 9: ENROLLMENTS IN DAY, EVENING, AND DISTANCE EDUCATION



Note: Both bachelor and undergraduate are included in the figure.
Source: ICFES *Estadísticas de la Educación Superior* various years

Natural sciences, and Engineering equally exceeded the average growth in enrollments. Conversely, the Humanities and Religion, Fine arts, and Health programs declined in relative share, although they expanded in the absolute number of students enrolled.

During a period of exceptional growth, the agricultural sciences stand out as the weak spot showing a ten percent drop in enrolment between 1990 and 2000. This number becomes all the more alarming when one considers that the agricultural sector not only earns the country 22 percent of its exports, but also employs a large fraction of Colombians, many of who live in poverty (DANE, 1999). Given worldwide experience of high productivity growth in agriculture—the highest long run sectoral productivity growth in the world—the decline in enrollment in this field could eventually reduce the sector's potential for generation, adaptation and dissemination of new knowledge with negative bearings on prospects for rural poverty alleviation.[23]

In an international comparison, Colombia appears to emphasize social sciences at the expense of technical education. Figure 11 presents the distribution of students in undergraduate and Master's programs for Colombia, all of Latin America, and USA. For both levels, the share of students enrolled in social sciences is higher in Colombia than in Latin America and the USA. In 1996, enrolment in the social sciences accounted for 60 percent of total undergraduate enrolment and 73 percent of graduate enrollment in Colombia, compared to a regional average for Latin America of 45 percent in undergraduate and 37 percent in graduate, and enrolment of 38 percent and 22 percent respectively in the USA. With respect to enrolment in tertiary technical training, only 27 percent of Colombian undergraduate students attended some form of technical institution compared with 43 percent in Latin America and 38 percent in the USA. Less than 15 percent of Colombian students in Master's programs were enrolled in technical careers, like the natural

23. The deficit of students in agricultural sciences is equally apparent in an international comparison. In Colombia only 3 percent of students in under-graduates and 2 percent in graduates pursue an academic diploma in agricultural sciences, while in an Latin America context, the shares are the double, 6 percent of undergraduate students and 7 percent of graduate students.

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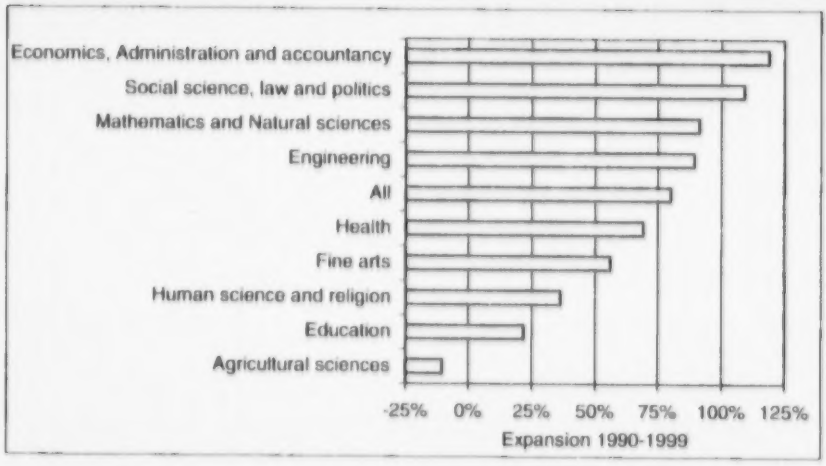
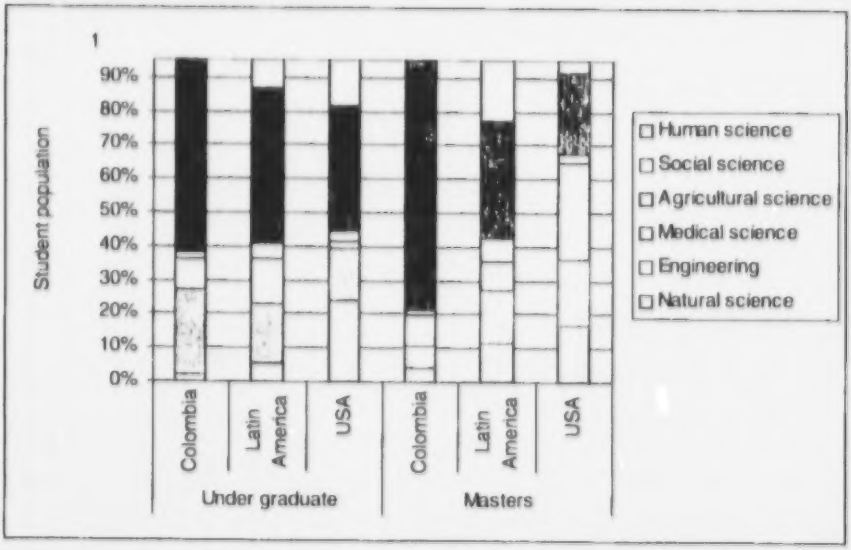
FIGURE 10: SOCIAL AND SOCIETAL SCIENCES EXPANDED
(Growth in Enrollment by Discipline, 1990–1999)



Source: ICFES *Estadísticas de la Educación Superior* various years

FIGURE 11: LOW SHARE OF STUDENTS IN TECHNICAL EDUCATION
(Composition of students by discipline in Colombia, Latin America and USA, 1996)



Source: RICYT (2000)

TABLE 7: LOW PRODUCTION OF PHDS
Insufficient PhD Enrollments

Country	All Doctoral Degrees	Production of Doctoral Degrees per 1,000,000 inhabitants
Brazil	5,344	31
Argentina	408	11
Mexico	734	7
Chile	57	4
Colombia	***16***	***0.4***
OECD Countries		
Germany	24,174	294
European Union	69,006	235
France	11,073	188
USA	42,705	152
South Korea	4,999	106

Source: RICYT (2000) Latest available years.
For Colombia: Data from ICFES pertaining to 199

sciences, engineering and agricultural science compared to 37 percent and 40 percent of Master's students in Latin America and the USA, respectively.

Programs: Biased Towards Undergraduate

Enrollment in Colombian Tertiary Education is strongly biased towards undergraduate programs while graduate and postgraduate programs accommodate only a small fraction of the student population. In 2001, there were approximately 10,000 programs offered in Tertiary Education in Colombia, of which 5,961 were undergraduate programs, 4,496 were graduate programs, and 47 were Ph.D programs. However, the undergraduate programs accounted for 94 percent of enrollments while only six percent of enrollments were in graduate and postgraduate programs.

The public sector originally enrolled nearly 80 percent of the graduate student population. However, beginning in 1975, private universities increased their share of graduate students with the hope of increasing revenues. Their strategy consisted of offering "Specialization degrees"—an intermediary degree between the first professional degree and the Master's degree. New graduates, eager to improve their job qualifications, enthusiastically sought these "Specializations" and enrollment at this level increased almost 20 fold, with the majority of students enrolling in "Specializations" not requiring a research component.

The Commission on Doctorates and Masters, the government body in charge of regulating graduate education, has no authority over "Specializations." Universities can freely establish new "Specializations" without regard for their capacity to offer high quality programs. In 1999 enrollment in "Specializations" was 90 percent of the total graduate student enrollment (41,573 students out of 46,106). The private university enrollment share in "Specializations" was 77 percent. In contrast, public universities accounted for 36 percent of enrollments (1,563 students out of 4,341) in traditional Master's programs where formal accreditation is mandatory.

The small number of graduates from master's and "specialization" studies sets an upper limit for the number of students who can enroll in doctoral studies.[24] In 1999, 180 students were enrolled in 47 PhD programs—equivalent to four PhD students per one million inhabitants.

24. Although a master degree is not a prerequisite for entrance into a doctoral program, the majority of doctoral students are widely expected to hold a graduate degree.

In that same year, tertiary institutions graduated 16 PhDs, or roughly 0.4 PhDs per million inhabitants.[25] This compares unfavorably with the rest of the countries in the region that have produced more than ten times this number of highly qualified PhDs. It is also insufficient if the country is to make strides in the knowledge economy, compete effectively in the global marketplace, and be able to replenish its faculty at tertiary institutions with qualified faculty. Public institutions have thus far assumed the main responsibility for educating PhD candidates with seven out of ten post-graduate students attending public universities.

The Tertiary Education sector has within the last decade taken serious steps to remedy the deficit of doctoral level graduates. Enrollment increased from 27 in 1990 to 180 at the end of the decade. Similarly, the number of programs experienced an impressive seven-fold increase. Nevertheless the rise will take several years to improve the average qualifications of lecturers and enhance research capabilities in the country.

The recent rise in PhD enrollments also shows a will to forge a new path and shift from the traditional dependence upon foreign PhD programs to educate Colombians. In the past, several government agencies have invested sizable resources in a small number of students to study abroad.[26] For instance, between 1993 and 1997 the average cost for COLCIENCIAS to send one Colombian abroad to study for one year was about Col$142 million (in 1999 prices), (Jaramillo, Garcia and Blom, Annex V in this report). For this investment, beneficiaries received a cutting-edge degree in an internationally known institution. Because recipients were obligated to return home upon completing their studies, the national innovation system often benefitted from their work. Nevertheless, the resources used to educate one individual could perhaps have yielded higher returns if it had been invested in developing domestic PhD programs and training students studying in Colombia. A good compromise to overseas study would be to combine domestic PhD programs with scholarships to a foreign partner-university for a short period (1–2 semesters). This has become the practice on the international scene and would serve to create frequent and stable relationships with foreign universities and promote internationalization of the Colombian Tertiary Education system.

Two additional practices used in many institutions worldwide could guide Colombian universities as they continue to expand their doctoral programs. First, in many foreign universities and research-centers PhD students frequently work with senior staff as junior researchers for which they receive scholarships in exchange for research and teaching assignments. This allows the frequent exchange of knowledge between staff and PhD students to their mutual benefit. Anecdotal evidence reveals that doctoral students in Colombia often have few research or teaching assignments thus limiting the value of doctoral students for the institutions. Second, financial incentives for joint university-industry cooperative research, corporate sponsored internships for students and part-time academic appointments for professionals from the productive sector can help strengthen the linkages between tertiary education and other sectors of the economy.

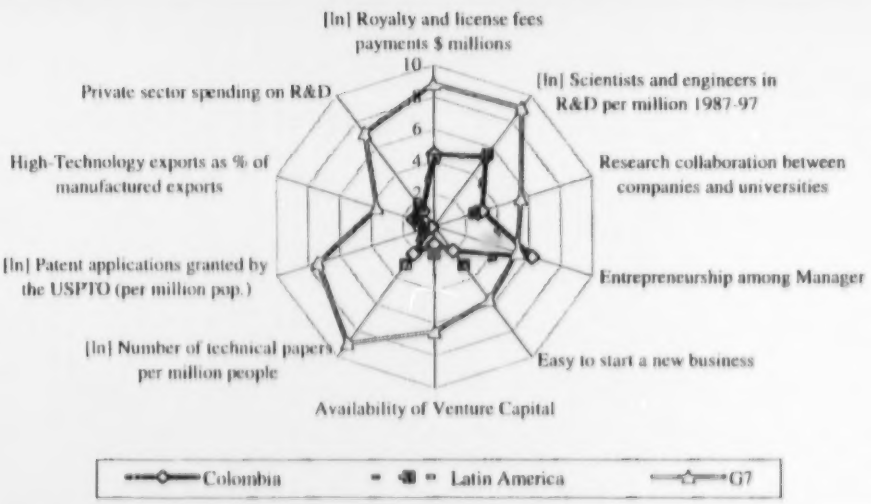
A Struggling Science and Technology Sector

The Science and Technology (S&T) sector forms the backbone of the national innovation system, in which Tertiary Education plays a prominent role as the supplier of skills and research. However, the sector craves advanced human capital. This section highlights the strengths and weaknesses of the Colombian S&T sector and how the universities interact with the other participants. For Colombia to embrace the knowledge economy it needs to create regulations that guide the S&T sector through introducing appropriate incentives and through the development of a long term, well coordinated and prioritized public policy. Figure 12 presents a selection of science and technology indicators.

25. For the 1990–1999 period, the average production of PhDs per year equaled 11.

26. As of writing there is no available information about the number of Colombian PhD-graduates at foreign universities that returned home to work, which could improve the standing of Colombia somewhat in the shown table.

FIGURE 12: STRENGTHS AND WEAKNESSES IN THE SCIENCE AND TECHNOLOGY SECTOR


[ln] Royalty and license fees payments $ millions
10
8
6
4
2
[ln] Scientists and engineers in R&D per million 1987-97
Research collaboration between companies and universities
Entrepreneurship among Manager
Easy to start a new business
Availability of Venture Capital
[ln] Number of technical papers per million people
[ln] Patent applications granted by the USPTO (per million pop.)
High-Technology exports as % of manufactured exports
Private sector spending on R&D
Colombia
Latin America
G7

Strengths: Centers of Excellence, ICT and the Private Sector

The S&T sector in Colombia has several strengths. COLCIENCIAS, with assistance from multilateral agencies, has established several centers of excellence. Funding from these agencies along with allocations from the national budget have for the most part been distributed in accordance with international best practice through awarding block-grants to research through competitive mechanisms. However, it is uncertain at this point whether the centers can support themselves from the sale of services or from international funding.

The level of investment in information and communication technology (ICT) compared to regional competitors is impressive in Colombia. The information infrastructure constitutes by far the most developed element of the Colombian NIS, which, according to several indicators, is approaching the G7 level. Telecommunications, liberalized in the 1990s, is one of the most dynamic sectors of the Colombian economy and now accounts for around 7 percent of GDP. Turnover for the sector passed US$2 billion in 2000. Compared with other countries in Latin America the Colombian telecommunication system is well developed, ranking third in terms of telephone coverage in the region, with 16 lines per 100 inhabitants, just behind Argentina and Chile, which have 20 and 17 lines per 100 inhabitants, respectively.

The Colombian private sector is technologically well developed. The value added of high and medium-high industries reaches seven percent of GDP, which almost equals that of the average OECD country which is 9.8 percent. However, knowledge-based industry declined 20 percent since 1994. The chemical industry dominates the knowledge-based production in the country with more than six out of ten knowledge intensive products a result of work from this industrial branch. Accommodating this and other important industries' demands in terms of human capital and assuring an open, free flow of knowledge between research centers could be an important step fostering a diverse and well-functioning National Innovation System.

Weaknesses: Human Capital, IP Protection and Unequal Funding

The National Innovation System suffers from the under development of two important components: human capital and regulations that stimulate innovation. These weaknesses impair technological

advancement and hold back the full exploitation of the entreprenecurial, knowledge-based industries that the country possesses.

The scarcity of researchers with advanced knowledge and up-to-date skills prevents industries in Colombia from moving towards the knowledge economy. Nine out of ten companies in the largest knowledge-based industry, the petro-chemical industry, cite lack of human capital as the predominant obstacle to innovation (Part II of this report elaborates on this finding). Furthermore, the gap of technically educated workers in Colombia leads to intense competition between companies for qualified labor.

Innovation in the S&T sector could be further stimulated through the strengthening of intellectual property rights. Colombia does not yet provide adequate and effective intellectual property protection. As a result, Colombia remains on the special US "Watch List" of countries with inadequate intellectual property rights protection. Without proper IP-protection companies will not be able to reap the returns of expensive innovation activities and therefore often opt to buy foreign technology.

Funding to public research shows great regional disparity. Until 1996, the district of Bogotá received the entirety of public resources budgeted to S&T. Today, the capital area still obtains more than 80 percent of funding a clear indicator that further diversification could be considered, (DNP, 2001).

A prime role of the science and technology system is to acquire and adapt foreign knowledge to the Colombian context and its companies. For personnel in the S&T sector to be able to grasp and import foreign knowledge, universities should make available to their graduates and researches the knowledge available in the surrounding world and thereby promote internationalization of the Tertiary Education sector in Colombia.

A Nascent Internationalization of Colombian Tertiary Education

The internationalization of Colombian Tertiary Education has been characterized by its heterogeneity. Although some of the universities have developed an internationalization culture over the last 25 years, most of the institutions have been very timid in their efforts to overcome parochialism despite an enabling legal framework. Nevertheless, there seems to exist a need for a coherent action plan that encourages internationalization. Governmental policies expressed through administrative acts, or through financial support mechanisms do not provide sufficient incentives or a well-defined framework to participate in the international academic life.

Thus far the only systematic interaction to tap into the global pool of knowledge has been the funding of studies abroad. ICETEX, created in 1952 with the explicit focus of lending to students abroad, and COLCIENCIAS are the two government entities that provide resources for select, outstanding students. As of 2001, ICETEX aided 1005 Colombians studying abroad. More than half of the beneficiaries chose to attend institutions in Europe and in particular Spain, where 40 percent of all students chose to study.[27]

The Colombian Network for International Cooperation (RCI) gathers most of the International Relations Offices of Tertiary Education institutions in the nation together, with the purpose of stimulating, promoting and strengthening the culture of international cooperation within Colombian universities. RCI carries out four main activities:

- Training in international management,
- Gathering information on, and publication of, cooperative opportunities,
- Encourage academic mobility through *Intercambio Académico, Técnico y Científico*, a program that organizes exchanges with 27 regional universities, and
- Promotion and exportation of Tertiary Education services.

27. Bilateral programs equally offer the opportunity to acquire education in the developed countries to a significant number of young Colombians. Namely, Fullbright commission, British Council, Alliance Francaise, DAAD (Germany) and Spanish agency for international cooperation.

Tertiary Education institutions have the autonomy to establish mutual agreements with foreign universities but no precise data exist about the nature of these international agreements. Nevertheless, it is certain that the last 10 years have brought increased institutional participation in this type of collaboration and that Colombian universities now participate in hundreds of such agreements. Most of these agreements are institution to institution in nature and tend to be "letters of intent" rather than action oriented, financially committed plans. Furthermore they show minimal development in terms of active support of the internationalization process, particularly in relation to research, student and faculty mobility, joint academic programs and events, and administrative interaction.

Colombia has become an important market for international universities, due to limited coverage and lack of modernization in Colombian tertiary education, particularly at graduate and post-graduate levels. In recent years, the country has seen a growing presence of international universities offering degrees or certificate programs. Countries like Cuba, Spain, and lately Australia, have increasingly competed for Colombian students. As has been the case in many countries, there is a growing concern about the quality of such programs being offered since the accountability issues for such "multinational" university programs have not been defined yet. It is realized that formal internationalization does allow institutions to engage, not only in the traditional form of collaboration, but in other types of activities which help to improve the quality and the recognition of Tertiary Education and help the society to be better positioned in the globalization process.

A clear political commitment is desirable not only from the Government, but from academia itself, in order to break the relative isolation of Colombian Tertiary Education and for the country to fully benefit from progress made elsewhere. The Government's role is to enact legislative and regulatory acts and to provide adequate funding—provisions that will ultimately determine whether Tertiary Education institutions can become fully internationalized. The Government has the responsibility of dealing with foreign policy, immigration, and labor force development, which need to be adjusted in order to respond to the challenges imposed on Colombian Tertiary Education institutions. The term internationalization should be adopted in the agenda of Tertiary Education for future years given the implications it can potentially have on the country's development and its ability to compete in an open market.

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2

Economic Issues and Perspectives

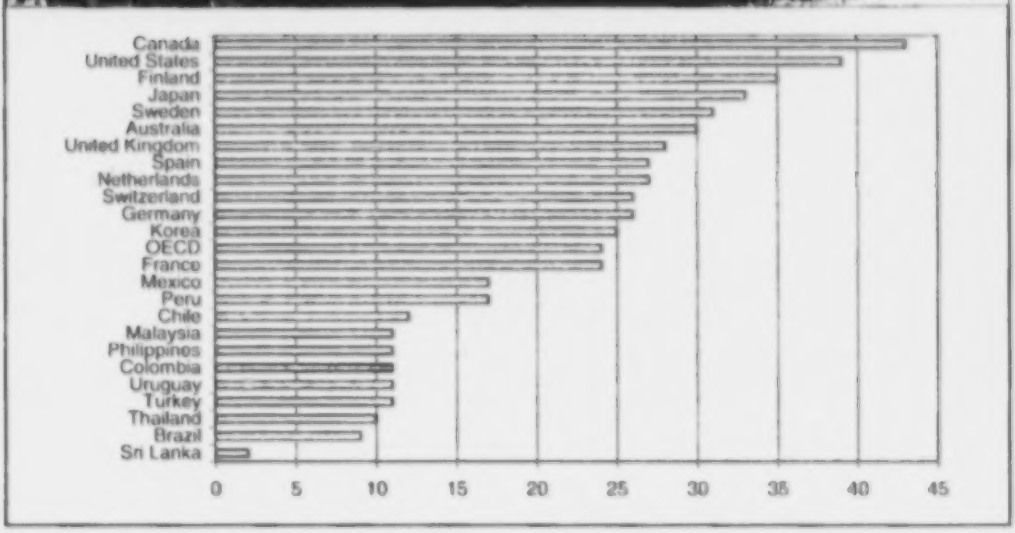
Society as well as the individual have an interest in and will receive benefits from investments in Tertiary Education. Tertiary education institutions perform multiple, essential roles in society. Part II of this sector study will focus on the economic value of Tertiary Education which views Tertiary Education as an investment in human capital that increases both individual and economy wide productivity and pays off in terms of higher income. Social and economic research has widely documented the importance of the massification of all levels of education as a fundamental factor underlying sustained economic growth and poverty reduction. Given the high benefits from tertiary education, Colombia has a keen interest in expanding tertiary education.

Within a supply and demand framework, section two argues that the country faces two main obstacles to expansion: (a) rationing the number of seats in the low-fee charging, public universities and (b) stifled demand in tuition-based private education. The subsequent section describes and analyses public funding to Tertiary Education in order to increase the number of available seats in the public sector. It finds that funding is in line with international best practice. However, public universities seem to have room for enhanced internal efficiency, which could be encouraged through performance based funding that rewards the best managed institutions. The report then considers the policy options for stimulating demand for private education. The analysis finds demand remains constrained as a result of students' inability to pay the high costs. This suggests reforming the policy for financial aid and enlarging the financial aid program with a revenue-neutral student loan scheme as the cornerstone complemented by a limited, well-targeted scholarship program for low-income students.

Increasing External Efficiency

This section shows that the productivity of workers with tertiary education has risen considerably over the last decade due to structural adjustment, including deepened integration into the world economy and technological progress. Currently only one in nine Colombian workers has attended Tertiary Education, significantly undermining the country's competitiveness. Without a substantial increase in the attainment of Tertiary Education in the Colombian work force, the competitiveness of domestic firms will be handicapped due to lack of qualified labor. The increased productivity of

FIGURE 13: COLOMBIA TRAILS SEVERAL LA COUNTRIES AND OECD IN ATTAINMENT
(Attainment of Tertiary Education in the Labor Force)



Source: OECD (2001) and for Colombia: DNP (2001).

human capital has resulted in fiercer competition for skilled labor pushing up wages and the value of the production of tertiary graduates. However, the high level of unemployment, common to all education levels, impairs the sector's contribution to the economy.

Tertiary Education as a Fuel for Economic Growth

While the various mechanisms through which tertiary education contributes to social and economic development are not fully understood, and precise measures of these contributions are not available, numerous reports document that education is a prerequisite for development.[28] Within an economic growth framework, Tertiary Education affects economic growth through two channels: increased human capital and enhanced technological capabilities. Additionally, human capital contributes to growth through institutional strengthening and social development.

The contribution of Tertiary Education to human capital is widely measured by the attainment of Tertiary Education. Note should be taken that this indicator only reflects quantity of education and not quality. While only 1 in 9 Colombians attended tertiary education and even fewer have completed, the share of workers with tertiary education in Colombia exceeds the typical share in the region; however, according to OECD data the Mexican and Peruvian economies enjoy a more advanced labor force (Figure 13).

Compared with the average OECD country, where approximately 24 percent of the labor force has a tertiary education, Colombia trails substantially with just 11 percent of the work force having attained a tertiary education.[29] At first glance, this might appear as a relatively small differ-

28. The list of report and research papers is long and includes: Mankiw, Romer and Weil (1992); Benhabib and Spiegel (1994); Barro and Sala-i-Martin (1995); Barro (1997), Krueger and Lindahl (1998), Bils and Klenow (1998 and 2000); Topel (1999), Pritchett (2000).

29. The difference between OECD countries and Colombia in attained Tertiary Education is smaller than the gap in enrollment rates, 54 versus 15, because coverage expanded faster in the last 40 years in the OECD area than in Colombia. Even though the recent surge in enrollment in Colombia closed somewhat the gap.

ence. However for Colombia to catch up, its tertiary system must double enrollment over night and maintain this level of enrollment for 40 years—the average length of an individual's labor force participation—concurrently with stagnation in enrollment in OECD countries tertiary systems. Additionally, the available pool of advanced human capital in Colombia is exhausted by emigration of skilled workers to high-income countries. Box 2 discusses the magnitude, reasons and policy challenges of Brain Drain.

BOX 2: BRAIN DRAIN IN COLOMBIA: THE LOSS OF HIGHLY ADVANCED HUMAN CAPITAL

Emigration of highly qualified individuals out of developing countries was recognized as a problem several decades ago, yet reliable data on the extent and impact of Brain Drain remain scarce. Unfortunately, what data exists confirms fears that the most skilled individuals are the most likely to emigrate.

Anecdotal evidence suggests that Brain Drain is a serious issue in Colombia. The Colombian communities in the two typical countries of destination, USA and Spain, have swelled during the last decade where both push-factors for emigration (escalation of the violent conflict and severe economic recession) and pull-factors (economic prosperity in countries of destination and easing of immigration laws) have attracted a growing number of highly educated Colombians.

A recent study [Carrington and Detragiache, 1999] estimating Brain Drain based on 1990 US Census data for US immigrants by education level. In almost all cases, individuals with tertiary education formed the highest percentage of immigrants. Only countries geographically close to the US [Mexico, Central America, and the Caribbean Countries] had higher percentages of immigrants with secondary education rather than tertiary. Immigrants with only primary school education were a distant third (7% of total immigrant). [Some systematic undercounting of immigrants with less educational attainment is inevitable in these data].

For Colombia, Carrington and Detragiache found that 8 percent of Colombians with Tertiary Education opted to leave their home country to work elsewhere. However, the study draws upon data from 1990, a point in time where the exodus from Colombia had not assumed alarming proportions. More recent reporting on brain drain from Colombia suggests that the Colombian economy has suffered a much more substantial loss of advanced human capital. The New York Times (April 10, 2001) cites sources that estimate that approximately 1.1 m Colombians—mostly highly educated- have left the country in the last ten years. The article estimates that the Colombian-American community numbers more than 430,000 émigrés and is rapidly growing. However, no systematic data are available. Findings for other countries are found in the table below:

Brain Drain Statistics by Country and Emigration/Immigration Flows

Country (ies)/ Geographic Area of Origin	Emigrants living in US (1990)	Emigrants in the US with Tertiary Education	Tertiary Emigrants/ Total Emigrants	Country	*Percentage of Population with Tertiary Education who Emigrate*
México	2,700,000	351,000	13%	*Jamaica*	*77%*
Philippines	730,000		+50%	*Guyana*	*70%*
China	400,000	200,000	50%	*Ghana*	*26%*
India	300,000+	225,000+	75%	*Iran*	*25%**
Korea	300,000+	159,000+	53%	*Philippines*	*10%**
Africa	128,000	95,000	75%	*Korea*	*15%**
Jamaica			42%	*Pakistan*	*7%**
Trinidad/Tobago			46%	*Egypt*	*7%**
South America			Roughly 50%	*India*	*2.7%**

(*Includes only immigrants to OECD countries; actual total are likely higher)

BOX 2: BRAIN DRAIN IN COLOMBIA: THE LOSS OF HIGHLY ADVANCED HUMAN CAPITAL (*Continued*)

These estimates, their limitations notwithstanding, strongly suggest that many developing countries are failing to capitalize on investments in education due to loss of qualified personnel through emigration. It is increasingly recognized that individuals who emigrate do not always represent an absolute loss to their country. Many maintain beneficial links to their countries of birth, becoming conduits for knowledge and technology transfer. Others may re-emigrate later in life, with vastly enhanced professional skills and experience. Nonetheless, the magnitude of the problems calls for the attention of policymakers.

Recent economic analysis shows that educated individuals become more productive (and therefore receive a higher wage) after they immigrate. It is not true, as some economic theories would hold, that as a scarce resource in the developing world, educated people command a higher wage premium than they would in the OECD, where educated workers are already abundant. Instead, it seems the presence of other educated individuals (the so-called "critical mass") raises the productivity of all. An educated individual in isolation—as many find themselves in developing countries—is not able to capitalize on that education. Human capital must be surrounded by more of its kind, in addition to physical capital and the networks of institutions and infrastructure that make up a national innovation system (NIS), in order to be productive.

Facing this situation, policymakers must seek to increase the opportunities available to their brightest citizens. Without attractive alternatives at home, emigration rates will not drop. This cannot, of course, be achieved overnight. Simultaneously, policymakers must find ways to capitalize on expatriate diasporas, and to use foreign-based nationals and foreign training as a channel for knowledge flows. At the same time, individual countries must monitor and analyze much more comprehensive data on this phenomenon.

Technological progress and sustainable growth in all sectors of the economy are not possible without the contribution of an innovative tertiary education system, which generates new knowledge through basic research and builds absorptive capacity through its graduates. Recent experience in both developed and developing countries, epitomized by the exceptionally long period of economic expansion in the US, has spurred renewed emphasis on the importance of knowledge and technological progress for economic growth. Several reports on economic growth find that technical progress can in large part account for improved living standards. Easterly and Levine (2000) estimate that up to 80 percent of cross-country variation in economic growth can be attributed to a broad definition of technological progress. Case studies highlight the necessity of frequent interaction and knowledge flow between universities and the private sector, which creates an environment where basic research becomes practically and commercially oriented.

The 2001 World Bank report on economic development in Latin America and the Caribbean underscores the necessity of increased application of knowledge and innovation in production in Latin American countries, De Ferranti, Perry, Lederman, and Maloney (2001). For Colombia, this message is important since the country relies to a high extent (59 percent) on the export of natural resources and agricultural products where cutthroat competition and high price volatility reign. Without a high functioning, flexible tertiary education sector that bestows domestic producers with sufficient, high quality graduates, the private sector is unlikely to develop new and improved products or production techniques. Consequently, the country's manufacturing sector could stagnate on the current step of the technological ladder, unable to climb further, and will continue to rely upon imported technology and low value-added exports.

The scarcity of advanced human capital is creating a bottleneck for technological innovation in the Colombian private sector. A survey of obstacles to innovation carried out by DNP identified human capital as the predominant barrier to technological progress. Among the petrochemical companies, one of largest industries in Colombia, ninety-one percent complain of the lack of available, qualified labor. The lack of human capital becomes all the more important considering that

TABLE 8: HUMAN CAPITAL: THE MAIN OBSTACLE TO PRIVATE INNOVATION

Industry	Research capacity	Economic & financial	Human capital
Petrochemicals	29,2	31,3	91,0
Plastic products	49,8	55,3	62,2
National average	*50,2*	*50,9*	*55,3*

Source: Colciencias and DNP, [1996] *"Encuesta sobre Desarrollo Tecnologico en el Establecimento Industrial Colombiano," 1996 and* OCyT, [2001]

the chemical industry produces 60 percent of Colombia's knowledge intensive production and was the only knowledge-intensive industry that expanded following trade-liberalization.[30] Responding to the lack of human capital is critical for the development of high value added production in the country and it can only be accomplished through the Tertiary Education sector.

Looking beyond the narrow economic growth framework to public social benefits, tertiary education promotes nation building through greater social cohesion, trust in social institutions, democratic participation, open debate, and the appreciation of diversity (gender, ethnicity, religion or social class differences). Pluralistic and democratic societies need the kind of research and analysis that are fostered through the social sciences and the humanities. Additionally, tertiary education may contribute to reduced crime rates and corruption, and to increased community service such as philanthropic donations and NGO and charity work. There are also strong social benefits associated with improved health behavior and outcomes.[31]

When examining the public benefits of tertiary education, it is important to highlight the existence of joint-product effects linked to the complementarities between tertiary education and the lower levels of education on the one hand, and between the education sector and other government services, like health-provision. The linkage between tertiary education and the lower levels of schooling has the potential of a virtuous cycle in as far as the quality of tertiary education is strongly determined by the quality of secondary school graduates.[32] Similarly, the quality of secondary schools depends heavily upon the quality of teachers who graduate from teacher's colleges. This role of tertiary education in support of the overall education system is increasingly important in Colombia in view of the progressive massification of secondary education.[33]

Rising Private Returns to Tertiary Education

The limited supply of highly skilled labor combined with the increased demand for workers in the expanding technological frontier and the integration of national markets, places the lucky few with Tertiary Education in a favorable situation on the labor market. The typical worker with a tertiary education earns Col$886,000 per month, the equivalent of US$392, which is 275 percent more than the average worker and more than 6.5 times the wage of a worker with no education (Table 9).[34]

The high premium to education in general and to Tertiary Education in particular, combined with large discrepancies in attained schooling, is one of the fundamental sources for income inequality in Colombia, Nunez (2002). Although wage-gaps in developed economies reach equally

30. A background study for this report: "Science and Technology in Colombia; Status and Perspectives" elaborates on these and other findings.

31. Wolfe, B., and S. Zuvekas (1997). "Nonmarket Outcomes of Schooling." International Journal of Educational Research. Vol. 27, No. 6, pp. 491–501.

32. Equity in tertiary education is equally strongly linked to the equality in lower secondary education.

33. As later sections discuss, these areas of Tertiary Education with social benefits extending beyond the individual should be a focus for the public sector.

34. Source: DNP 2000 based on statistics from DANE. A background study on economic perspectives of Tertiary Education, Blom (2001), presents more detailed earnings and employment statistics by education group.

TABLE 9: URBAN LABOR MARKET INDICATORS BY LEVEL OF EDUCATION (2000)

Education level	Wage (Monthly) ('000 Col $)	Wage (Monthly) (USD$)	Wage in percent of average
No schooling	137	62.4	42.6%
Primary	208	94.7	64.6%
Secondary	278	126.2	86.1%
Tertiary	886	402.7	274.5%
Total workforce	323	146.7	100.0%

Source: DANE and DNP.

important magnitudes, they tend to be less pronounced. The average OECD worker with Tertiary Education earns 46 percent more than a colleague with a secondary diploma, OECD (2001). The lowest skill-premium occurs in countries that have invested heavily in education, like Australia (24 percent skill-premium), Denmark (24 percent) and France (26 percent). This compares with 219 percent in Colombia.[35] Such a high skill-premium prevails through out the Latin American region as a consequence of under-investment in education and promotion of technologically developed industries. In concert these factors raise the skill-premium and exacerbate income inequality. Increased supply of skilled labor would be a growth-enhancing policy that over a time horizon of 10 to 20 years, would reduce the skill-premium and drive down wage-inequality.[36]

During the 1990s, Tertiary Education became an increasingly sought after asset. Figure 14 shows the evolution of labor market earnings from 1988 to 2000. Beginning in 1992, university educated employees experienced an increased value to education reaching 125 percent of its value in 1988, where as after the recession half of the gain was lost. Nevertheless, workers with tertiary education were the only education group whose wages moved in a favorable direction. In comparison, graduates from primary and secondary school suffered a reduction in wages of more than 15 percent.

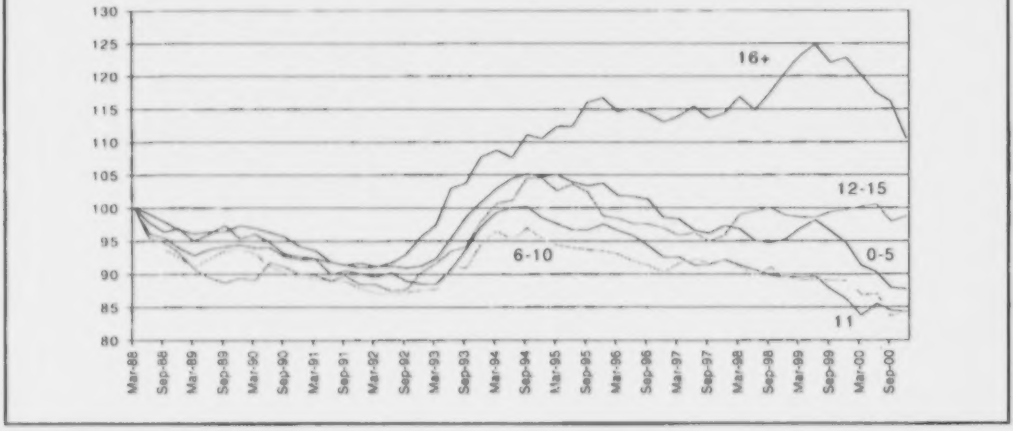
Available labor market data yields limited information on how different disciplines and institutions perform on the labor market and therefore the economic relevance of taught skills could not be inferred. The lack of data reduces overall economic efficiency in two ways: (a) Information about bottlenecks in the labor markets for certain disciplines cannot be conveyed to future students and the supply of skills will therefore not be directed towards demanded disciplines. As a consequence a mismatch between the qualifications demanded and the skills offered could arise, lowering the efficiency of the education sector, and (b) The individual institution's labor market performance, most often measured in unemployment rates and average wages of the graduates, remains unknown. Students are hence relegated to hearsay information. Consequently, the institutions have less incentive to enhance the relevance of their education since the information will only slowly and imperfectly pass on to the buyers of their service, the students.[37] The lack of recent studies on labor market perfor-

35. The income gap for Colombia is gross of tax, while the OECD measures net of income tax. Factoring this measurement difference would presumably decrease the difference in skill-premium somewhat.

36. See Wood "Globalization and Wage Inequalities: A Synthesis of Three Theories," Santamaria (2001) "External Trade, Skill, Technology and the Recent Increase in Inequality in Colombia," Blom, Holm-Nielsen and Verner (2001): "Education, Earnings and Wages in Brazil 1982–1998" and Blom and Velez (2001) "The Dynamics of the Skill-Premium; Growing Demand and Insufficient Supply?"

37. In North America and in some European countries, universities have career-centers that monitor and publish the labor market performance of their graduates. For instance, in Mexico, the association of private universities, FIMPES, stipulates that member universities record graduates' labor market performance. For the institutions, this system provides a vital connection to their alumni, which often donates significant amount of money to their former institution, and furthermore allows the institution to directly measure the relevance of taught classes. For potential students, the information is critical for evaluating consequences of choosing a given institution and discipline.

FIGURE 14: HIGHER EDUCATION, HIGHER SALARY
(Wages by Education Group, 1988–2000)



Source: Nuñez (2002)

mance of graduates from technical and technological institutions could be crucial, since international experience shows that these graduates often have had to struggle to find employment.[38]

Detrimental High Unemployment

A rising demand for highly educated workers should simultáneously translate into rising wages and falling unemployment for this type of worker. Does this occur in Colombia? High unemployment plagues the Colombian economy including graduates from tertiary institutions. More than one out of six individuals is searching for a job. In the past two decades, job opportunities increased markedly for those with tertiary education. On average, 9.7 percent of workers with Tertiary Education were unemployed compared to 14.3 percent, 11.8 percent and 11.4 percent for secondary, primary and those with no schooling respectively.[39] However, the last recession has equally curtailed employment opportunities for tertiary education graduates. Nevertheless, the unemployment rate for the highly educated is 16 percent and remains below that of secondary graduates which is 18 percent.

The high unemployment rate implies a sizeable human and economic loss, especially for the well-educated unemployed who have received several years of costly education and could, with some experience, be highly productive. The increase in unemployment is common to all education groups suggesting that factors outside of the Tertiary Education sector are to be blamed for the loss.

Despite the high unemployment, multiple sources of economic and social data indicate that returns to investment in tertiary education in Colombia are high and growing. Although, the growing wage-premium fuels wage-inequality, stakeholders and policymakers should keep in mind that the intensified demand arises from increased productivity and/or better allocation of highly

38. In Chile and Venezuela, unemployment rates for graduates from short-term technical education reached above 30 percent, which partial was caused by low relevance of the taught skills.

39. The high unemployment of well-educated graduates is primarily a result of high youth unemployment, which the figure does not take into account. The high youth unemployment heavily affects the unemployment rate for the well educated, since these education groups are relatively young.

skilled labor. The situation provides decision makers with an opportunity to expand supply of advanced human capital and thereby further promote technological progress and economic growth, which will raise living standards for the entire population.

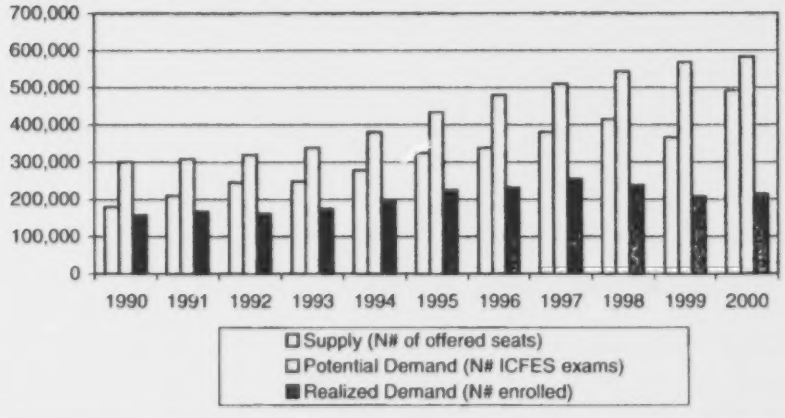
A Segmented Market for Tertiary Education

The private benefits from Tertiary Education are substantial and have increased over the last several years, suggesting that the benefits outweigh the costs. According to economic theory, such a situation would induce economic agents, operating in a well functioning market, to undertake additional investment in human capital and thereby acquire Tertiary Education. Within a medium-term time frame, the supply of skilled labor would increase and put a downward pressure on the wage premium to workers with Tertiary Education, while fostering higher labor market income, greater productivity and improved living conditions. Nevertheless, the persistently high, and rising returns to tertiary education, combined with the decline in first time enrollments into tertiary education points to the existence of one or more barriers to a smooth functioning of the market for Tertiary Education. This section takes steps toward explaining the underlying economic reasons and choices behind the current sub-optimal situation using a supply and demand framework.

The supply of seats in tertiary education increased markedly in the 1990s (Figure 15). Starting from a supply of 180,000 seats in 1990, the system expanded considerably and offered 492,000 seats in 2000 (a 173 percent increase). Expansion was driven primarily by the expansion of private institutions that increased supply from 119,000 seats to 352,000 seats (296 percent increase).

Concurrently, the potential demand for tertiary education—measured as the number of graduates from secondary education that took the ICFES exam-grew while the continuation rate from secondary education declined. Three hundred thousand youngsters sat for the ICFES-exam in 1990, and of those, 180,000 (52 percent) made it into tertiary education. By 1999, the potential demand had increased to 568,000, but only 367,000 enrolled (37 percent). Hence, a divergence between potential demand and realized demand occurred. Or in other words, the continuation rate from secondary to tertiary decreased.

FIGURE 15: LARGE EXPANSION IN SUPPLY UNMATCHED BY DEMAND
(Supply and Demand of Seats in Tertiary Education)



Source: ICFES *Estadísticas de la Educación Superior* various years

The falling continuation rate has taken place within a system that increasingly experienced vacant seats. For the sector as a whole, supply surpassed demand generating an oversupply of seats. Moreover, the oversupply increased throughout the 1990s. At the start of the decade 22,600 seats were left empty at the onset of the semester (Figure 16). As institutions expanded supply during the decade, the number of vacant seats increased as well so by the dawn of the new century, 260,000 seats were left unoccupied.

Investigating the oversupply in more detail, it is observed that the oversupply occurred primarily in the private sector. In 1990, public institutions accommodated more students than they offered seats, while twenty-two thousand seats were available in the private sector. During the decade, public institutions experienced only a small number of vacant places, whereas private providers witnessed significant increases in the number of vacant seats. In 1999, vacant seats in public institutions accounted for only one out every ten vacancies.

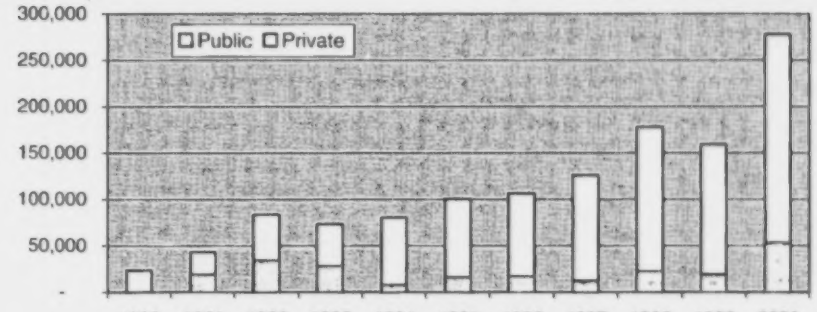
This observation point to a distinct segmentation of the market for Tertiary Education, where households clearly—and understandably—distinguish between the low fee-charging public sector and the high-fee charging private sector. Low fee-charging Tertiary Education continues to be in strong demand, outstripping supply, and leading to rationing in the market for public Tertiary Education. The opposite situation arises in private education, where supply exceeds demand, implying a growing oversupply.

These simple considerations carry important policy implications. Reversing the poor enrollment performance of the last three years and returning to an expanding trend in tertiary education could arise in two ways:

1. *Expand supply in the public sector.* Policymakers could expand the supply of seats in public tertiary education through either increased funding or improved efficiency.
2. *Stimulate demand in the private sector.* Policymakers could focus on initiatives that address factors that stifle demand for tertiary education. Primary among these factors are the options for financing tuition and earnings foregone during the time of study.

Both policy options are linked to the financing of the sector. They differ in the sense that option 1 focuses on funding of the public sector, while option 2 targets demand side financing of the private sector. The policy options will therefore be discussed separately in the two following sections.

FIGURE 16: OVERSUPPLY OF PRIVATE SEATS
(Number of vacant seats)



Source: ICFES *Estadísticas de la Educación Superior* various years

Funding a Selective and Efficient Public Sector

This section analyses the available policy options for expanding the coverage of tertiary education in Colombia via public institutions. Currently, the government allocates only 4 percent of GDP to education, of which, in line with international practice, 16.5 percent flows to Tertiary Education. A major injection of government resources would therefore not be recommended given the regressive nature of Tertiary Education expenditures from a national perspective. Increased access to public Tertiary Education should be sought from within the existing pool of resources. Section two considers the option of increased enrollment and improved functioning through a strengthened focus on priority areas for the public sector, which could leave room for the private sector in non-priority areas. Subsequently, the possibilities for expansion through enhanced efficiency are explored. The findings suggest that there is room for efficiency improvements within public institutions. As section four discusses, increased coverage from greater efficiency and selectivity could be achieved by introducing performance based funding which would reward institutions performing according to national priorities, such as equity and efficiency.

Public Funding of Tertiary Education

This subsection highlights budget allocations to education in general and to tertiary education in particular. Although tertiary education systems increasingly rely on private financing, the role of the state has well-justified economic reasons for supporting the sector. Tertiary education investments generate major external benefits that are crucial for knowledge-driven economic development, including long-term returns from basic research and technology development, and social benefits, such as social disparities, increasing health and life expectancy, decreasing pressure on social welfare programs, and strengthened social cohesion. In addition, tertiary education plays a key role in support of basic and secondary education. Since individuals alone do not capture all these benefits, an exclusive reliance on private financing would result in under investment in tertiary education, (IHEP, 1998).

During the 1990s, the government gradually and significantly reprioritized spending in education (Table 10). In accordance with best practices and economic recommendations, budget support to education increased substantially from 2.2 percent of GDP to 4.3 percent in 1999. In real terms, the education sector experienced a 150 percent increase in its available budget. Despite the reprioritization, Colombia under spends on education. A general rule of thumb for overall investment in education as a share of GDP is that investment in the education sector should at least be in the 4 to 6 percent range. However, the calculation does not take into account private investment in education, which absorbs a non-negligent amount in Colombia.

TABLE 10: PUBLIC FUNDING TO EDUCATION (1990–1999)

	1990	1992	1994	1996	1998	1999
In bill. Col$						
Tertiary Education	686	632	711	982	1,189	1,201
Basic Education	1,919	2,189	2,921	3,838	3,797	4,281
Other Education expenditures	306	1,413	889	1,304	2,114	1,802
Total Education	2,911	4,233	4,520	6,125	7,100	7,284
In % of GDP						
Basic Education in % of GDP	1.44%	1.62%	2.03%	2.61%	2.60%	3.08%
Tertiary Education in % of GDP	0.72%	1.34%	0.81%	0.97%	1.40%	1.18%
Total Education	2.16%	2.96%	2.84%	3.58%	4.00%	4.26%
Tertiary Education in % of education Spending	23.6%	14.9%	15.7%	16.0%	16.8%	16.5%

Source: Ministry of Education

Note: Amounts measured in constant 2000 prices

TABLE 11: RESOURCES FOR PUBLIC UNIVERSITIES (1992–2000)

Year	Budget from National Gov. (in %)	Budget from regions (in %)	Tuition (in %)	Other (in %)	Sum
1992	73.3	4.8	14.4	7.5	100
1994	69.8	4.2	17.4	8.7	100
1996	61.4	3.1	24.6	10.8	100
1998	62.2	2.8	23.4	11.5	100
2000	63.4	6.5	21.0	9.0	100

Source: ICFES *Estadísticas de la Educación Superior* various years

Note: Based on enrollment in Bachelor, Specialization and Master degree programs. (Costs to post graduate program are excluded)

Within the education budget, a shift towards basic education took place. In the beginning of the 1990s, Tertiary Education received 24 percent of the entire education budget. After a major revising of budget prioritizations in 1992, the budget share to Tertiary Education declined to 15 percent and has since hovered at around 16 percent.

Certain guidelines can be applied to ensure a balanced distribution across the three education sub-sectors in relation to a country's level of education development, pattern of economic growth, and fiscal situation. Expenditures on tertiary education should represent between 15 and 20 percent of public education expenditures. Countries that devote more than 20 percent of their education budget to tertiary education, especially those that have not reached universal primary education, are likely to have a distorted allocation that favors an elitist university system at the expense of basic education. However, as is evident in Table 10, the adjustment in 1992 brought Colombia in line with current economic thought. Given the existence of important public benefits indicating that the cost of insufficient investment in tertiary education can be very high, it should be clear for policy-makers that public funding of Tertiary Education in Colombia has reached its nadir and that economic rationale speaks against further reductions.

The prospects for increasing public funding to Tertiary Education remain bleak given the current economic and fiscal situation. Even when the fiscal situation improves, it is questionable whether Tertiary Education should receive a larger slice of the pie, since this budget line figures among the most equity-regressive in the budget, (World Bank, 2002). From a national point of view, increased public spending should not be the driving force behind Tertiary Education expansion.

Faced with a surging number of secondary graduates knocking on the doors to state institutions, public institutions in Colombia have responded in the best interests of the country by diversifying their revenue base and thereby accommodating more students.[40] The introduction of and the rise in tuition constitute an important part of new income generation. Table 11 shows the sources of revenues for state universities. In 1992, three out of four pesos came from state coffers, while private households only provided one peso out of every seven received. As of 2000, the end-user contributed to a greater extent, one out of every five pesos.

Directing Public Resources to Its Core Responsibilities

The traditional and predominant role of the state in the financing and provision of tertiary education is rooted in political and economic circumstances that have now radically changed. Colombia is—like many other middle-income countries-rapidly moving from a small elite system to a mass tertiary education system. This massification process, along with structural adjustment, has out-

40. In many of the region's countries, for instance Mexico, Brazil and Argentina, public institutions have not been able to accommodate the rising demand through a broadening of the revenue base due to a combination of virulent political protests from the student population, lack of incentives and legislative barriers.

stripped the government's capacity to finance expansion. Many governments have, therefore, encouraged the growth of private institutions to ease pressures on the public purse and to satisfy pent up demand. The co-existence of large private and public sectors requires public universities to integrate and strategically reorient the sector towards its core responsibilities as public institutions.

What are the public sector's core responsibilities? The public sector should focus on those tasks that benefit society and which the private sector is unwilling to assume. This places a large and multi-dimensional obligation on the shoulders of state funded universities. It implies that public institutions should not engage in competition with the private institutions, not because they are unable to compete, but because the taxpayer's resources come with a cost and should therefore not substitute for private money. Public institutions would best serve their mission therefore by redirecting the public resources towards areas where the social value exceeds the private value. The areas of high social value depend upon multiple factors that each country, government and population will have to prioritize.

The following paragraphs suggest areas of high social value that the government could continue to promote. The report looks at two possible core tasks: equity and disciplines with high social value.

Equity. Within Colombian society, there exist large disparities in income and access to public services including Tertiary Education. It is often perceived that a fundamental ***raison d'être*** of the state is to mitigate unequal conditions by providing equal opportunities. The public sector can address equity in various ways. The report highlights two aspects in this section: (i) provide seats in public institutions to low-income students, and (ii) accommodate students in provincial areas, where private institutions tend to not operate.[41]

Although public universities continue to improve equity in Tertiary Education, a growing share of low and middle-income students enroll in the private sector either voluntarily or due to rejection from public universities. Figure 17 shows the share of students from given income-deciles who were enrolled in the public sector in 1974, 1992 and 1997. For all three years, the curve declines with increasing income, which indicates that well-off students, to a higher extent, opted to enroll in private institutions. Over time, a larger fraction of students from the lower- and middle-income deciles attended private universities. While this trend is seen across all income levels, it is the most dramatic in the lowest five deciles.

In 1974, the low income half of the population sent more than 80 percent of students to the public sector. This declined to less than 40 percent in 1997.[42] This is most likely the combined result of the expansion in the number of secondary school graduates and the relative stagnation in the public Tertiary Education system. Competition for entering public Tertiary Education became fiercer, which pushed relatively less competitive students to the fee-charging private sector. Due to differences in the quality of secondary education received, access to private preparation courses, and family backgrounds, these less competitive students are more typically from relatively poorer households. As a consequence the regressive nature of public spending on Tertiary Education worsened.

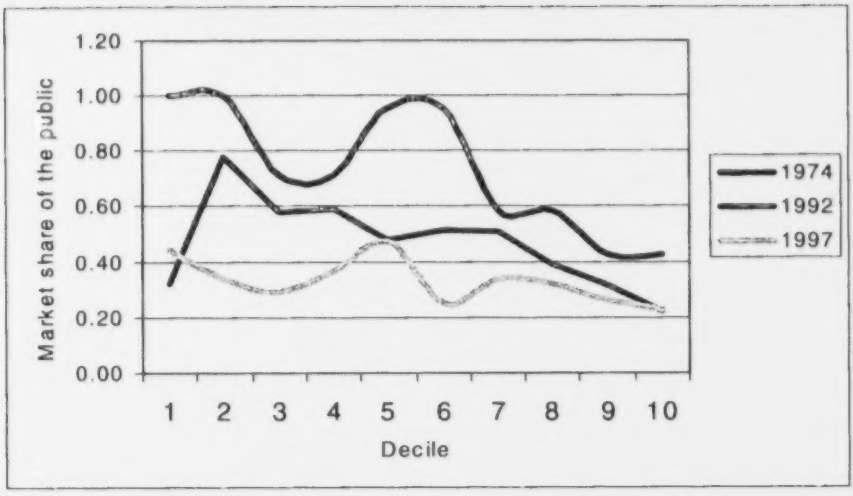
Equity through a provincial focus. The public sector cannot only address equity concerns through the enrollment of low-income students, but also through promotion of regional development, Given the necessity of private education to recover costs, the sector most often proves unwilling to extend education beyond the large metropolitan areas. Figure 18 illustrates that the public sector assumes the responsibility and indeed provides more education in low enrollment regions than its private counterpart. Budget prioritization of regions with low coverage or modest population and little private presence improves both social equity and makes economic sense. In those areas, increased funding does not substitute for private expenditures on Tertiary Education and therefore achieves the full impact on coverage.

41. The following section discusses a third option, stimulating demand for private education through targeted student aid.

42. The curves oscillate somewhat for the lower half of the deciles. This can be explained by the low number of students from the lower deciles, which increases the uncertainty of the estimates.

FIGURE 17: LOW INCOME STUDENTS INCREASINGLY ATTEND PRIVATE INSTITUTIONS

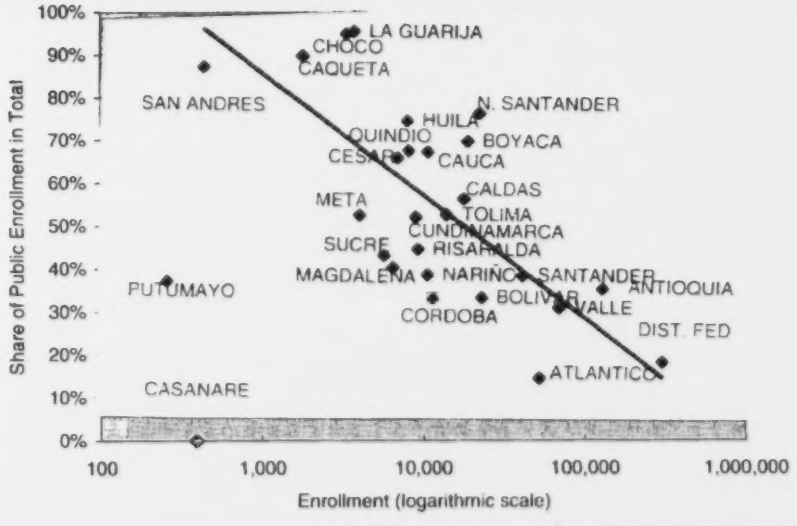
(Attendance in Public Tertiary Education per Decile)



Source: World Bank (2001) based on household data "*Encuesta de Hogares*" from DANE

FIGURE 18: PUBLIC SECTOR DOMINATES IN LOW ENROLLMENT REGIONS

(Public Share of Enrollment and Total Enrollment by Region)



Source: ICFES (1999)

Note: The line excludes two extreme points: Putumayo and Casanare.

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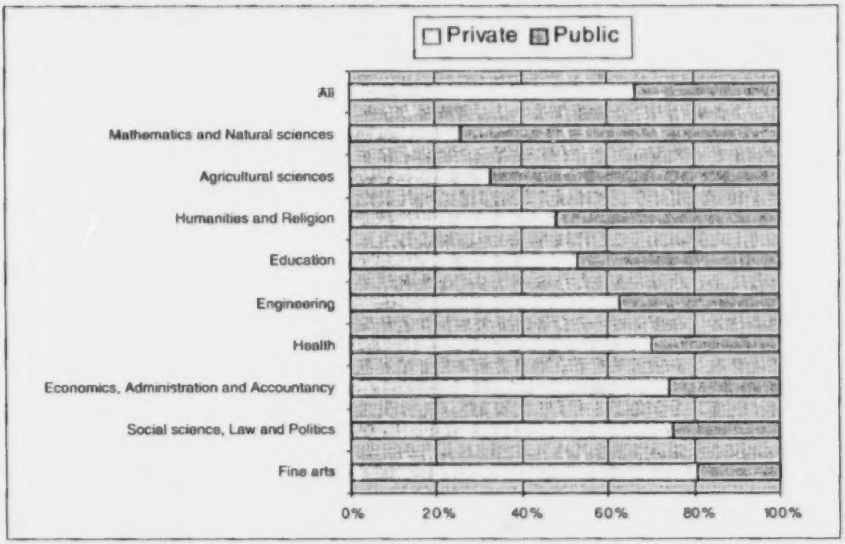
FIGURE 19: OWNERSHIP INFLUENCES FIELDS OF STUDY
(Enrollment by Field of Study and Ownership, 1998)



Source: ICFES *Estadísticas de la Educación Superior* 1998

Disciplines with a social value exceeding the value paid to the individual could be another core responsibility of public universities. Given the obligation of students, and their families, enrolled in private institutions to pay high tuition, career choices are typically based on anticipated (high) monetary returns from their investments in Tertiary Education and therefore focus on high yielding social fields, like law, political science, economics and business. Society however depends critically upon other disciplines where the private returns diverge from the social returns. Traditionally, disciplines that serve the public like health and education as well as careers that promote rural development, like irrigation and agriculture, have been identified as high social value. Similarly, the natural sciences and technical disciplines have been identified as being of social high value.[43]

Colombian state institutions seem to focus on fields of study with perceived high social value. Figure 19 shows that the public sector accounts for the largest share of enrollments in mathematics and the natural sciences, agricultural sciences, and education, while the private sector accounts for the majority of enrollments in the softer, high-earning disciplines like law, economics, business and politics.

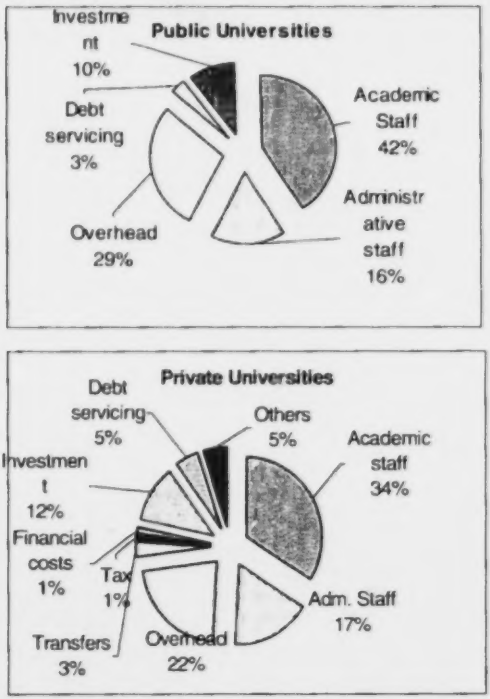
The government of Colombia could have other core responsibilities than the three touched upon in this subsection. The main message is that policymakers should assure that public funding does not substitute for private resources, in which case Tertiary Education coverage would decline. The public sector should be selective and focused in its offering of courses.

Efficient Utilization of Public Funding

To serve the country in the best way, the public sector not only has to prioritize strategic areas of high social value, but also has to educate students efficiently. This section provides insight into the

43. Assessing the social value of education in general and of individual disciplines in particular is extraordinarily demanding in data requirements and there exist no consensus on findings.

FIGURE 20: PUBLIC UNIVERSITIES SPEND MORE ON ACADEMIC STAFF THAN PRIVATE
(Cost breakdown for Universities, 1998)



Note: Base on all costs, which includes: Current costs (Salaries to academic and administrative staff, overhead costs, transfer and tax) as well as debt servicing, financial costs, investments and other costs.

internal efficiency of the Tertiary Education sector and as such investigates the possibility for expanding public education through efficiency gains. It does so by examining the costs of producing graduates in Colombia as well as the factors that underlie cost-differences.

Providing an individual with Tertiary Education requires an expensive investment everywhere in the world, including Colombia. One student year requires an outlay of Col$ 3.6 million corresponding to 105 percent of Colombia's GDP per capita. Table 6 displays unit costs for private and public universities. One year of schooling in public universities costs Col$ 4.2 million compared to the unit costs of Col$ 3.3 million in private universities. Hence, public universities spend 29 percent more on each student enrolled per year. A closer examination of the expenditure pattern of the two types of institutions illustrates that remuneration of academic staff weighs more heavily in the costs of public institutions than in private institutions (Figure 20). State run universities spend 42 percent of their budgets on salaries to academic staff compared to 34 percent in private universities. Hence, the difference in unit costs does, to a certain extent, reflect a difference in spending patterns. For the remaining expenditures, the public sector mimics the private sector.[44]

44. The substantial difference in unit costs between private and public universities does not reflect that public universities educate a larger number of masters relative to bachelors. On the contrary, the private sector actually enrols a larger fraction of students in Master programs than public universities. (Master programs include students enrolled in "especialización").

The higher cost related to academic staff in the public sector corresponds with the higher teacher-student ratio existing in this sector. As discussed previously, the state sector employs one full-time equivalent faculty member per 17 students, whereas this ratio for private universities is 1:27. The higher unit costs in the public sector seems therefore to be related to a higher number of faculty members per student combined with more generous benefits. However, drawing a conclusion would need a detailed comparison of employment terms, unit costs by discipline as well as research and teaching obligations, which is beyond the scope of this sector study. International evidence indicates that tenured staff in public universities in developing countries often enjoy generous benefits and have very limited obligations to perform research.

In an international comparison, the Colombian university system lies at the high end of the cost scale when comparing per student expenditure relative to GDP per capita (Table 12). One year of university education costs five percent more than the average income of a Colombian. This exceeds the level prevailing in developed countries, where one year of university education in general requires 48 percent of GDP per capita. For low and middle-income countries, Colombia still figures among the more expensive systems. Within the countries, where there is available data, only Malaysia and Chile spend more resources per school year than Colombia.

On the input side, Colombian institutions stay clear of a recurrent problem in educational management: overspending on labor inputs at the expense of physical inputs. As a rule of thumb, countries that spend more than 20 percent of their tertiary education budget on non-education expenditures are probably under-investing in non-salary pedagogical inputs crucial for quality

TABLE 12: TERTIARY EDUCATION COSTS AND INPUTS

Country	Exp Per Student/ GDP per Head	Ratio Students to Academic Staff (a)	Salaries as % Current Costs (b)
Colombia (All universities)	*1.05*	*20.3*	*68.2*
Colombia (Public universities)	*1.22*	*17*	*72.2*
Colombia (Private universities)	*0.95*	*27*	*66.2*
Malaysia	1.61	20.4	52.1
Chile	1.09	NA	NA
Non-OECD Average	0.89	NA	NA
Brazil	0.86	12.6	NA
Mexico	0.79	9.4	84.1
Hungary	0.75	9.9	68.0
USA	0.74	14.1	60.2
OECD Average	0.48	16.7	69.1
Portugal	0.48	18.5	71.9
The Netherlands	0.45	18.7	77.2
Finland	0.42	17.2	61.7
United Kingdom	0.38	16.7	44.8
Uruguay	0.35	15.7	79.3
Spain	0.34	17.6	79.5
France	0.31	17.2	68.8
Italy	0.25	29.0	72.3

Source: OECD *"Education at a Glance 1998."* For Colombia (1998) and Brazil (All Tertiary Education): Estimates by World Bank, based on ICFES (2000).

Note: NA stands for "Not Available." The category "All universities" is an average of the private and public weighted by the size of enrollment.

(a) For Colombia Full time equivalent positions.

(b) Current costs for Colombia consist of: Salaries to academic and administrative staff, overhead costs, transfer and tax.

learning. The Colombian system devotes 66 percent of current outlays to salaries, which is slightly below the average of 70 percent.

Although, aggregated national data and international comparisons should be taken with a grain of salt, the high costs in Colombia suggest the existence of slack in the Tertiary Education system, especially in the public sector. On the one hand, the higher unit costs in public universities could suggest the existence of slack in the management of public institutions, less efficient use of tenure, or more generous employment terms. On the other hand, it could equally stem from higher research activity, different courses and superior quality. This judgment depends upon whether the supplementary effort devoted to academic staff in public universities merits the cost difference and merits more careful analysis.

Providing Incentives in Public Funding

Many countries, as part of Tertiary Education reform, have chosen to alter the principles upon which public funding is based. These reforms have be an important vehicle for fostering internal efficiency and increased coverage. Currently in Colombia the Ministry of Education allocates budget resources based on historical precedence and negotiation. Stakeholders have discussed the introduction of a funding system based on observed performance that would endow institutions with transparent incentives to direct their efforts and functioning towards nationally agreed objectives.[45]

The reforms often involves a mix of the following features:[46]

- Government aid should take the form of block grants with a high degree of discretion left to the institution as to their detailed allocation;
- Revenues generated by institutions, from whatever source, should constitute a net addition to total resources: i.e. they should not be offset by reductions in government block grants;
- Within institutions, similar principles apply: budgetary devolution down to the school or faculty level, and in turn down to departmental level; and
- Recognition that budgetary discretion brings a very high degree of responsibility, accountability and transparency.

Institutional financing systems ought to be seen as equitable between institutions and give appropriate incentives for internal efficiency. One way of ensuring this is through a simple funding formula. Initially this might be input-based on say, number of students, and refinements could be added later to bring output indicators into the formula.[47] A related feature of a funding formula is that it be based on system-wide criteria. Therefore, institutions, which have higher costs than the norm—taking into consideration the disciplines offered—are penalized, and those that are efficient have more resources to re-deploy.[48] It is important to note that there is no ideal formula valid for all countries under all circumstances. Rather, a country must choose an allocation mechanism consistent with the goals and priorities of its tertiary education development strategy and be prepared to make changes over time as these goals and priorities evolve.

In addition, any funding formula should also take into account aspects of cost structures which are specific to individual institutions. A necessary first step would be to establish some system-wide unit cost norms for students in different broad fields of study (social sciences, laboratory-based sciences, engineering, languages, etc) and to determine block grants to institutions accordingly.

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45. The national goals could involve regional goals as well aimed at spurring regional specialization and development corresponding to existing regional needs.

46. For a more comprehensive analysis of these issues see Quentin Thompson: "Trends in the Governance and Management of Tertiary Education," LCSHD Paper series No. 33, World Bank, November 1998.

47. Formulas which are input-based are clearly second best to output based formulas, but they are generally more complex and difficult to implement. However they can offer very clear advantages over ad hoc incremental allocations based on no discernible criteria.

48. A. Hauptman, "Accommodating the Growing Demand for Tertiary Education in Brazil: A Role for the Federal Universities?" LCSHD Paper No 30, The World Bank, November 1998

To apply investment resources as an incentive for the transformation of tertiary education institutions, some countries have established a competitive fund to promote quality improvements. Institutions are invited to formulate project proposals, which are reviewed and selected by committees of peers according to transparent procedures and criteria. The eligibility criteria depend on the country and the specific policy changes sought. In Argentina and Indonesia, for instance, entire universities as well as individual faculties or departments can submit proposals. In Chile, both public and private institutions are allowed to compete. The system of performance contracts in place in France is a variation of the competitive fund mechanism. Four-year contracts are prepared and signed between the state and the institutions which commit them to a plan of action to pursue quality improvements in return for extra-budgetary financial resources.[49]

Filling the Vacancies in the Private Sector

Tuition Based Private Institutions

Private institutions of Tertiary Education arise for a multitude of reasons, including social and religious motives as well as the desires of regional and industrial development. As is the case in many countries, the presence of private institutions in the Tertiary Education landscape in Colombia has brought about more diversity and choice for students while serving as a powerful incentive for public universities to innovate and modernize. The private institutions share the need for high non-governmental revenues to cover their operation.[50]

The private sector offers courses predominately affordable and available to specific, well-off segments of the population and should therefore not be considered a panacea to the lack of advanced human capital in Colombia or any other country. It is meaningful only for those who can afford to pay tuition or have access to financial aid. Acquiring tertiary education necessitates large investments not only in terms of time—and hence foregone earnings—but also in the considerable resources needed during studies.

Table 13 quantifies the funds required to pay tuition for various programs in private tertiary education. The average private education costs Col$2.1 million per year, which amounts to 60 percent of the GDP per capita.[51] A typical family with only one income would have to give up over half of their yearly income for at least three years to finance Tertiary Education for just one household member. Only a small minority of families would be willing and capable of the necessary sacrifice.

Tuition levels vary according to institution and type of enrollment. Universities charge the highest yearly fee, Col$2.8 million, followed by the newer University Institutions, Col$2.1 million. There is a large heterogeneity within each group of institutions. For instance, the most expensive university course charges Col$8.6 million per year compared to the least expensive at Col$299,000 per year. The vocationally oriented Technical Training Institutions that charge less than half the fee of universities (Col$1.3 million) are the least expensive. The requirements for long-term courses at universities, in terms of substantial human capital and possibly greater physical inputs, clearly raise the costs of those programs, whereas technical or technological institutions employ far less costly inputs.

The cost distribution demonstrates that non-university tertiary education can be provided at relatively moderate costs. The higher demand for tertiary education could therefore be accommodated through the expansion of technically oriented courses for lower costs than the alternative expansion of traditional academic careers. This kind of diversification of Tertiary Education has only recently started in Colombia. Enrollment in technical and technological institutions in Colombia account for only 14 percent of total enrolment whereas, a modern and well-diversified

49. One of the important additional benefits of competitive funding mechanisms is to encourage tertiary education institutions to undertake strategic planning activities to be able to formulate proposals based on a solid identification of internal strengths and weaknesses and a rigorous action plan.

50. In Colombia, private Tertiary Education institutions receive 81 percent of revenues from tuition and fee-based education.

51. GDP per capita in 1999 was Col $ 3,588,000 according to The World Bank Database.

TABLE 13: TUITION FOR UNDERGRADUATE IN PRIVATE INSTITUTIONS (1999)

Type of Institution	Tuition per year (Col$ '000)	In % of GDP per capita	Cost per student (Col$ '000)
Tertiary Institution (All)	2,148	60%	2,828
University (All)	2,759	77%	3,276
University (Day time only)	3,179	89%	—
University (Evening only)	1,813	51%	—
University (Distance only)	1,332	37%	—
University institutions	2,130	59%	2,488
Technological institutions	1,440	40%	1,372
Technical Training institutions	1,307	36%	1,256

Source: ICFES *Estadísticas de la Educación Superior*

Note: Tuition per program is unweighted average. University tuition by type of course is based upon the ICEFES classification D/S (386), N/S (91) and Dist. (16), where the number in parenthesis indicate the number of programs in the particular category.

tertiary education system often enrolls one third of its students in two to three year long, skill oriented courses. However, in order for the graduates of technical institutions to be able to obtain employment, it is crucial that the skills provided by these institutions be of sufficient quality and relevance, otherwise the resources to finance the schooling would be wasted.

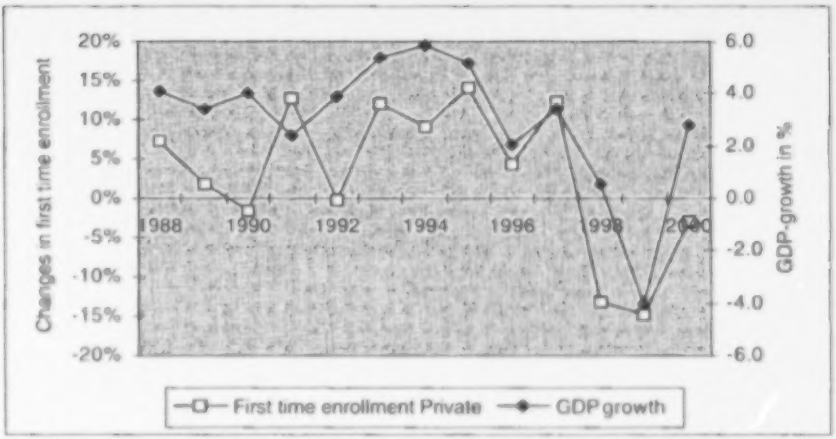
Short Term Crisis Reduces Long Term Investments in Education

The high cost of private tertiary education naturally affects a households' decision whether to enroll a family member. Due to the sector's increasing reliance on private financing, coverage becomes increasingly dependent upon a family's ability to invest in their children. Under a fully, publicly funded system, coverage of tertiary education depends to a large extent upon the government's budget allocation to the sector, in contrast to a privately supported system, where the decision of individual households decides the coverage. Given that households' incomes are more volatile than government spending on Tertiary Education, the shift of finance burden will—if not accompanied by buffering institutions—induce fluctuations in enrollment. Figure 22 explores this idea by plotting the change in economic growth, as an indicator of disposable income, against the change in first time enrollment in private tertiary education. The co-movement suggests that the business cycle affects a household's decision to send their children to private Tertiary Education—and increasingly so. Specifically, the deep recession in the late nineties from which the Colombian economy has recently recovered, appears to have seriously stifled enrollment. It appears that the 3 year consecutive decline in entrants into private Tertiary Education of 15 percent, 17 percent and 4 percent—amounting to 100,000 in total—can be attributed to the severe recession.

Moreover, the decrease is logically occurring in the lower socio economic strata that cannot set aside the required income for long term investment in Tertiary Education. As a consequence, equity deteriorates as students from high-income backgrounds increasingly attend Tertiary Education institutions, while prospective students from poor and middle-income families exit the education system and enter the labor market. This is likely to be the main explanation for the inequalities in enrollment didn't improve in the last decade.

In international comparisons, the sharp decline in enrollment during the past recession is dramatic, but not unique. In Mexico, in 2001 and 2002, Tertiary Education enrollment stagnated due to a halt in economic expansion. During the 1998–99 financial crisis, Thailand witnessed a similar sharp drop in overall enrollment rates of 20 percent as a result of the fiscal, economic and political crisis and the lack of a cushion to buffer the economic shock. To avoid similar situations in the future, the government of Thailand opted to implement a student loan scheme.

FIGURE 21: FIRST TIME ENROLLMENT DEPENDS CRITICALLY UPON DISPOSABLE INCOME
(Entrants into Private Institutions and GDP-growth)



Source: ICFES *Estadisticas de la Educación Superior* for enrollment and World Bank for GDP-growth.

The short-term, economic disruption will have serious, permanent repercussions on the future earnings of those who exit the education system, since these individuals are less likely to re-enter the education system. The decline in human capital will be a factor holding back economic progress in general. Were the shortfall in revenues to be the prime culprit in this decline in enrollments, one policy remedy would be to increase access to financial aid, which would allow students and their families to postpone the cost of education to better times. The following section explores the availability of financial aid for students in Colombia.

Inadequate Student Aid

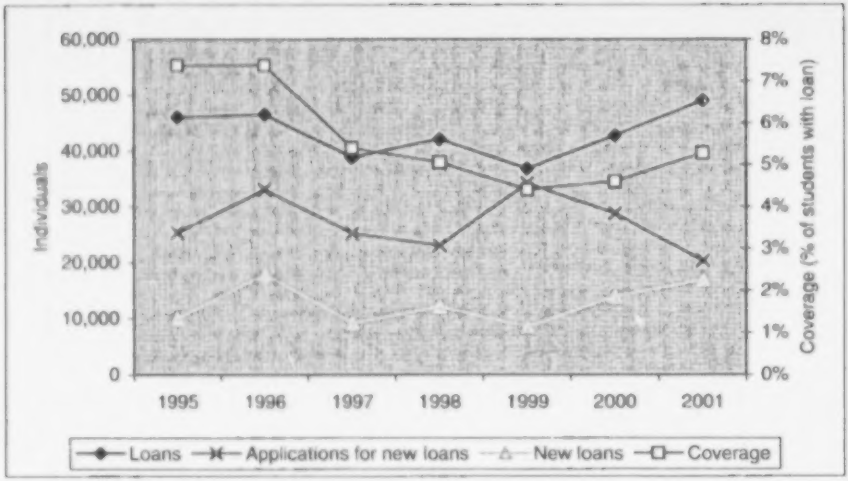
Student aid provides a widely implemented policy instrument allowing youth to invest in themselves despite the high costs of between 200 to 600 percent of GDP per capita for tertiary education. Financial assistance often involves a subsidy to students ranging from pure grants to implicit subsidies in student loans. Given the high and rising returns to tertiary education in Colombia and the rest of the world, student loans could be a revenue neutral instrument that allows students to defer educational expenditures to the moment when the benefits, in terms of higher salaries, start flowing in.

The existence of an extensive student loan scheme in Colombia could have shielded long term profitable investments in human capital from the short-term economic crisis in the last 4 years. This could potentially have avoided the accumulated decline of approximately 100,000 graduates from secondary school who chose not to enter tertiary education. Moreover, and perhaps more importantly, a deferred payment scheme could have permitted academically competent graduates from secondary school to continue onto tertiary education regardless of family income.

Student financial aid is currently offered to Colombian students in the forms of government-funded scholarships, discounts from tuition and fees offered by public and private institutions of Tertiary Education, and student loans from public and commercial banks.[52]

52. Several other organizations provide student loans, but these tend to be of less importance nationally and/or lend for studies abroad.

FIGURE 22: DECREASE IN DEMAND AND COVERAGE OF STUDENT LOANS



Source: ICETEX.

Government-funded scholarships are administered on a decentralized basis. According to preliminary data, the funding represents less than one percent of total government funding for Tertiary Education and assists only marginally poor students. Discounts accorded by public and private Tertiary Education institutions seem, according to anecdotal evidence, to play a larger role. The use of need-based tuition distinguishes Colombia from most other countries where tuition levels are the same regardless of student circumstances.

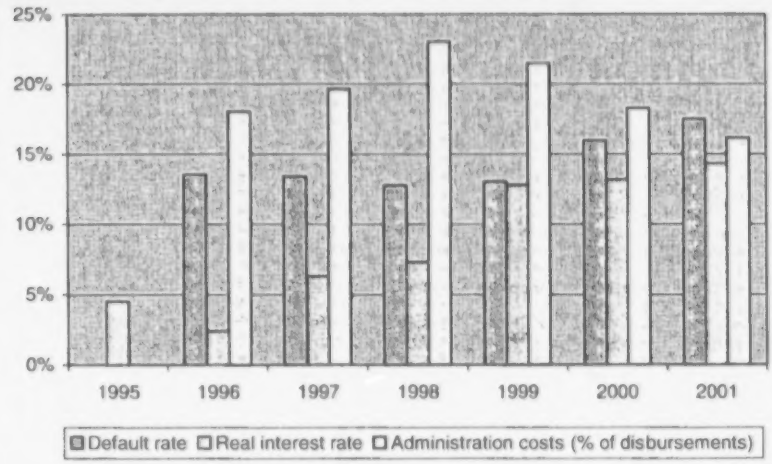
Student loans are supplied and administered by the Colombian Institute for Education Credit and Advanced Studies Abroad (ICETEX). ICETEX proudly holds the honor of being the oldest government sponsored student loan program in the world. It was established in 1950 and began operations in 1952.[53] The organization is well diversified through a network of 25 branches throughout the country.

Only 5 percent of students have access to ICETEX loans. Figure 22 illustrates the loan activity in the last seven years. In 2001, ICETEX provided 48,000 students with credits, a substantial increase of 10,000 from the last two years. Nevertheless, new loans continue to cover only 5 percent of the student population. The number of applications declined from 32,000 in 1999 to less than 18,000 in 2001 of which, 83 percent were accommodated. In the fall semester 2001, ICETEX fulfilled every eligible application.

The reduced demand is linked to the declining attractiveness of borrowing resources. Figure 23 presents the real interest rate on ICETEX loans, which reached 13 percent in 2001, substantially above real interest rates charged in student loans schemes around the world. Additionally, applicants must find two guarantors with collateral to be eligible for loans. While these instruments are important for high repayment rates, they severely hinder the access and attractiveness of credit, especially to the poor. Furthermore, the student loan body selects students on the basis of their financial need

53. Initially, ICETEX was formed to provide loans to students studying abroad. This restriction was waived in 1968. In the 1990s, more than 95 percent of its lending was to students enrolled in domestic institutions.

FIGURE 23: HIGHER REAL INTEREST RATES, HIGHER DEFAULT RATES AND LOWER ADMINISTRATION COSTS
(Determinants of Financial Sustainability of ICETEX)



Source: ICETEX.

and academic ability, but makes no differentiation in lending priority on the basis of the potential borrower's field of study.

ICETEX has improved financial management in the last decade. It relies only moderately upon government funding, which was 7.5 percent in 2000, while repayments on principal and interest (76 percent) provided the majority of income. Other sources of revenue, including returns on own invested resources supplied the balance (16.5 percent). ICETEX has suffered from a lack of liquidity—shortage of funds—due to the traditional reliance on government allocations for working capital and no attempts have been made to establish a secondary market through which the organization could obtain funds on commercial terms. In USA, student loan organizations often rely on commercial resources partly guaranteed by the state.

Fairly high administration costs and default rates reduce sustainability. Administrative costs equalled 16 percent of disbursements in 2001 and is declining. Around a third of the defaults can be attributed to the economic downturn, during which non-payments rose from 13 percent to 17 percent (Figure 23). This is presumably too high to achieve financial self-sustainability, although lower than default rates found in many developing countries.[54] For comparison, default rates on US-government guaranteed student credits reached 5.6 percent in 2001.

Financing of student credit through the private banking system has become more commonplace in recent years, in part to meet the growing unmet demand for credit created by the declining coverage of ICETEX. Under this credit approach, Colombian banks have formed partnerships with approximately 50 individual education institutions to provide short-term credit for students at those institutions. Nevertheless, coverage through bank-based student credit is low and generally has been limited to more credit-worthy, high-income students. Bank based loans have had a lim-

54. For international evidence on student loan schemes, see Albrecht and Ziderman (1995).

ited impact, since they have been in the form of short-term credit that must be fully repaid before the borrower completes his or her studies.[55]

The little rigorous experience that exists on equity impact of student aid suggests that for student aid to significantly improve access of low-income students, the aid has to involve a grant-element. Dynaski (1999) and ditto (2000) examine the bearing that untargeted aid to tertiary education had on access in the US. The study found that the grant significantly increased coverage, but deteriorated equity. The latter occurred, since students from well-off families only needed a little (financial) push in order to enrol, while low-income students in general needed larger incentives to attend tertiary education. To persuade students from the lower economic strata, considerable grants to cover tuition costs and possibly also living costs are needed.

Given the profitability of tertiary education, why does academically able students not borrow the required funds to shoulder the tuition costs? In the affirmative case, a market failure exists. Economists still debate this questions. In the Colombia context, there exist at least four reasons for why low-income families/students are unwilling or unable to attend tertiary education by borrowed means:

i. *Lack of guarantors.* Credits often require access to two guarantors, which disadvantaged students cannot always mount.
ii. *Little or no experience with loans.* Poor households have often been deprived of loans. They are hence sceptical towards indebting themselves by up to 200–300 percent of their annual household income.
iii. *Reduced coverage of student loans.* In order to reduce the fiscal costs of student loans, some programs limit the loans to cover tuition solely and do not cover living expenses. This limitation can effectively bar access for low-income students.
iv. *Information failure.* Two sorts of information failure are likely to play a role. First, tertiary education has for more than a century been the privileged of the elite, unprogressive families do hence not conceive of the possibility of sending a member to tertiary education. Second, the high return to tertiary education could be unknown to parents and therefore unwilling to assume debt believing it is a loss-making investment.

Depending on the seriousness of these obstacles, it could be that overall aid structure in Colombia is biased toward the middle class. This implies that student loan might prove insufficient to significantly improve equity in tertiary education. To promote equality, targeted scholarship could be necessary. This could be combined with an information campaign to inform families and secondary graduates about the loan opportunities for—and the significant gains from—tertiary education.

55. Fondo National de Garantias (FNG), a government-sponsored guarantor partially funded by ICETEX, has guaranteed the loans at two banks offering student credit as a way to encourage banks to provide longer-term loans. In 2000, FNG guaranteed roughly US$500 thousand in more than 600 loans primarily to students from families in the upper two income quintiles.

3

Strategies and Recommendations for Tertiary Education in Colombia

The ability of a society to understand, produce, adapt, diffuse, and commercialize knowledge is critical for sustained economic growth and improved quality of life. Countries that moved towards knowledge economy early—and where other conditions such as market incentives and strong institutions were present—now have economies that are deeply permeated by science, technology, and innovation. These are also the countries that have grown steadily and become increasingly wealthy. This is the primary reason why Colombia should revitalize its Tertiary Education and science and technology sectors. However, increased exposure to global competition, rapid technological progress, and Colombia's continued dependence on natural resources underscores the potential gains of a strengthening of the Colombian National System of Innovation in which Tertiary Education is a key element.

There is increasing pressure in Colombia for reform of the Tertiary Education sector. A growing number of secondary school graduates have had to abandon desires for Tertiary Education, yet employers progressively demand advanced skills, confirming the high and growing value of Tertiary Education for both the individual and society. Those pressures stimulated an impressive doubling of enrollment in the mid-1990s, which nevertheless has proved inadequate to accommodate the external needs and which furthermore, have brought rising concerns of inferior quality and obsolete study programs in certain segments of the sector. Therefore, considerable attention by both insiders and outsiders has been devoted to reform of the sector. There are signs of consensus on a long-term policy agenda which will most likely involve reaching towards a new tertiary education paradigm.

The challenges of the future lie with confronting traditional limitations within a rapidly changing environment. This transformation has already occurred in advanced economies and increasingly so in the Latin American region. Colombia's great challenge is how to become an active participant member of this new global society, the information and knowledge society which integrates technological and professional networks, platforms for improved innovative capacity, flexible labor markets and demand driven life-long-learning systems.

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A Strong But Under-Performing Sector

There are several reasons why Tertiary Education is an under-performing sector:

- ☐ *Opaque and ambiguous division of responsibilities* among regulatory bodies inhibits inter-agency collaboration in designing new initiatives. For instance, more than six regulatory bodies are involved in quality enhancement. Hence, the vast knowledge of the strengths and weaknesses of the sector that the government and its regulatory agencies possess does not lead to implemented reforms.
- ☐ *Declining quality.* The accreditation system in Colombia has stimulated improvements in the programs and in the institutions that have participated. Nevertheless, there is still concern that the quality of education has declined in recent years and has become less relevant in the new knowledge-based, global economy.
- ☐ *Lack of financing options* has led to a 28 percent decline of new entrants into private tertiary education since 1997, resulting in more than 150,000 unfilled seats in private institutions. Yet, given the current credit conditions, ICETEX fulfills every single one of the 12,000 received eligible applications (less than 5 percent of the student population). Similarly, the public system does not take advantage of existing financial instruments to foster efficiency. Seats in public universities cost 29 percent more than in private universities.
- ☐ *Unequal access.* The doubling of enrollment in the mid-1990s occurred primarily in the upper two quintiles, where coverage in 1997 reached 43 percent and 19 percent, respectively. Equity has not improved during the recent recession and the Colombian Tertiary Education system still provides unequal opportunities.
- ☐ *Underdeveloped postgraduate programs* are the most critical bottleneck in the system. This bottleneck bodes ill for fulfilling the sector's future needs for qualified lecturers to replace an aging professoriate and improve quality. Currently, only 2 percent of lecturers have doctoral degrees, and less than 14 percent have an advanced degree. Additionally, the country's competitiveness and innovation possibilities are at stake. Colombian companies cite lack of human capital as the most important obstacle to innovation. Colombia's National Innovation System suffers substantially from lack of advanced research skills.

These points testify to the need for an enhanced Tertiary Education sector in Colombia. To overcome these shortcomings, the incoming government could consider the following policy recommendations.

Ensure Clear and Progressive Governance

- ☐ *Create an effective institutional arrangement* for designing and implementing Tertiary Education policies centered on existing agencies. The Ministry of Education, the *Instituto Colombiano de Fomento para la Educación Superior* (ICFES), ICETEX, the *Fundación Colombiana Francisco José de Caldas para el Fomento de las Ciencias* COLCIENCIAS, CNA, CNDM, CESU, *Departamento Nacional de Planeación* (DNP), and the Consultative Committee should all be involved in Tertiary Education policy design and implementation. The specific functions and authority of each agency needs to be clearly defined to improve coordination of efforts and to prevent duplication and inconsistencies in policy design and implementation. The government should ensure that the policy framework is coherent and that the appropriate incentives are in place to encourage the various agencies to work together effectively. This is especially the case for the quality-assurance system, where the roles of the agencies could be clarified and differentiated further.

Induce and Assure Quality

- ☐ *Allow the creation of private accrediting bodies accredited by the CNA or other national agency.* In this way, the task of accreditation would be spread among several organizations

lessening the time taken to accredit programs and allowing accrediting agencies to keep up with the demands of the cyclical nature of the accreditation process.

- ☐ *Establish a new framework for accreditation that relies less on Input-based Criteria.* The use of an input-based accreditation model is effective in ascertaining that minimum standards are met and may be useful in recognizing new programs. Once a program has successfully met these requirements, it is important to go beyond these criteria and examine whether the program is effective at teaching students and that the desired learning outcomes are achieved.
- ☐ *Keep, but clarify and revise the "high quality accreditation."* The existence of high quality accreditation is an important development that should be protected from becoming a label for regular accreditation available to most programs. Nevertheless, the quality accreditation should be made more responsive to the needs of technological and technical institutions. A separate set of standards based on these institution's rationales and language would be appropriate. This could potentially avoid the perception of technological and technical institutions as being "second rate" institutions.

Provide Financing for an Equitable and Expanded Access

- ☐ *Reform the current student aid scheme.* Initially, loans should be targeted to poor, academically able students. As funds for the loan program grow, coverage can become universal.
- ☐ *Design a system of scholarships for the very poor—those in the lowest two quintiles.* Grants—and loans—should only be awarded to students attending an eligible (accredited) institution or program.
- ☐ *Implement performance based funding of public institutions that would reward high-performing, quality public institutions.* Such discussions have taken place among stakeholders for several years, but have so far, not brought any changes.

Promote Strategic Levels of Education

- ☐ *Expand enrollment in technical and technological courses.* This less resource-demanding tertiary education could be promoted by tying a proportion of financial aid to students attending these institutions. However, for this to be effective, the quality and relevance of these institutions must be improved, which could be achieved through (i) creation of accreditation procedures tailored for this type of education, and (ii) development of closer ties with the productive sector.
- ☐ *Increase the availability and quality of postgraduate training, especially at the Doctoral level that provides both faculty training and upgrading as well as training for higher level human resources in fields of national priority.* Scholarships linked to research and teaching obligations should be made available to eligible doctoral students.

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Annex

The Colombian Tertiary Education System: Problems and Challenges

Prepared by José-Joaquín Brunner

This paper attempts to analyze the causes of Colombia's higher education underdevelopment. First, regional comparative data for Latin America are used to show the scope and nature of the weaknesses of Colombia's higher education system and their impact on the nation's competitiveness. Colombia's advanced knowledge platform and main indicators of its higher education system are also scrutinized in order to assess these weaknesses.

Second, the underlying economic-political framework of Colombia's higher education system is identified as the single major cause of its relative underdevelopment. The framework is organized around three key features:

- A vertically disjointed system, horizontally divided among public and private sectors, with weak links between them,
- A public sector that operates without incentives (or with perverse incentives) to grow and to improve the quality and equity of the services it offers, and
- A highly fragmented private sector that, at its worst, offers services of poor quality whose suppliers are not eliminated by market forces.

As a result of the interplay between these features, higher education institutions and the Colombian higher education system have become blocked and are incapable of responding to a rapidly changing environment.

Third, new challenges facing higher education at the beginning of the 21st century—in particular globalization, the scientific and technological revolution, the intense use of knowledge in all sectors of society and the economy, and a changing occupational structure and labor market—demand new responses from Colombian universities and other knowledge-producing institutions.

Fourth, the argument is set forth that only trough a complete transformation of its funding system can higher education in Colombia meet these new challenges and adapt to the emerging environment. A set of policy options and instruments are discussed that eventually could lead to a new policy approach.

TABLE 1-1: COVERAGE

- Low coverage and inequity of access and retention
- Low social recognition and low coverage and quality of technical training
- Faulty development of basic higher level competencies
- Low scientific production
- Lack of definition of institutional typology
- Faulty education and low faculty dedication
- Incipient culture of self-regulation
- Management problems
- Low utilization of new technologies
- Inadequate financing
- Internationalization without common sense
- Incoherence among politics, purposes and national goals

Finally expected outcomes of that approach, if adequately implemented, are briefly reviewed.

The challenges facing the Colombian higher education system (HES) have been widely documented in various reports. Indeed, it is likely that among the nations of Latin America, Colombia has one of the richest portfolios of reports discussing not only the problems in the HES, but also development plans and recommendations for improvement.[56]

A significant imbalance exists, however, between proposals, on the one hand, and their application and results, on the other. Indeed, in spite of changes and advances that have occurred during recent decades (see Section 1: The Current Status of the System), "old problems persist" as the report The Basis for State Policy Toward Higher Education confirms. This report synthesizes the various points of view that have been expressed about the future of Colombian higher education and concludes: "We maintain a system that although very differentiated, has little or no diversification in its academic modalities, lacks flexibility, has problems of low coverage, equality and efficiency, and is not well articulated within the HES or with lower levels of education."[57]

A recent preliminary report of the Strategic Group of ASCUN points out that the problems within the HES center on twelve areas:[58]

The first four points reflect areas of consensus with regard to the state of higher education (HE) in Colombia: its low coverage, the problems of equity, internal efficiency, and quality, and poorly trained faculty leading to reduced student learning and low levels of faculty research. Practically every report refers to one or more of these areas when making a diagnosis on HE in Colombia.

The remaining eight points can be understood as causes or reasons for the imbalance mentioned earlier. Respectively, they point to: deficiencies in the institutional architecture and in the process of vertical and horizontal differentiation; inadequate development of academic human resources; weak quality assurance mechanisms with few incentives for quality improvement; an incoherent government plan for the development of the HES; low utilization of new information technologies and communication for the provision of educational programs and for improving the transparency and the administration of the institutional system; a financing mechanism that does not stimulate improvements in efficiency and quality; pressures from globalization; and, finally, lack of agreement among policy makers pertaining to the goals and the national plans for the HE Sector.

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56. A recent example can be found in Luis Enrique Orozco (comp.) (2001) *Educación Superior, Desafío Global y Respuesta Nacional (Volúmenes I and II); Universidad de los Andes, Bogotá.*

57. Comisión de Articulación del Sistema de Educación Superior (2001) *Bases para una Política de Estado en Materia de Educación Superior;* Universidad de Los Andes, Bogotá, p. 20.

58. ASCUN Strategic Group (2001) "De la Exclusión a la Equidad" (preliminary document, working draft).

Diagnosis

It is important to specify briefly the nature of the consensual diagnosis made because this type of diagnosis usually operates in Latin America due to a simple aggregation of elements rather than through a hierarchic description of relevant features, which is what is needed to identify causes and corrective actions.

One way to correct this deficiency is to introduce comparisons and to ask what is it that is unique to the Colombian HE situation with relation to other countries in the region. The following two tables offer a first approximation. The first one refers to Colombia's ranking in several indices that measure the comparative competitiveness of a group of countries in the region. The second summarizes the performance of the same countries around a group of variables that measure matters related to higher education.

Table I-2 shows that Colombia consistently occupies the last place in the indices of comparison, with only two exceptions: the Advanced Technological Index and the Innovation Survey Index, both of which Colombia barely surpasses Peru. The global panorama of Colombian competitiveness, therefore, should be reason for concern. One of the reasons accounting for this lack of competitiveness lies in Colombia's poor performance in specific rankings in education, higher education, science and technology, and the development of information and communication infrastructure, as shown in Table I-3.

While the average education level of the Colombian population surpasses that of Brazil it is below the average of the comparison group, placing it at a level similar to Egypt, Zimbabwe, Algeria and India. The participation rate of 18–24 year olds in tertiary education while below the Latin American average is similar to Brazil and Mexico. At the same time, the population older than 25 years of age with some post secondary education is less than 10%, while in Argentina it is 20% and in Chile, 16%. Public spending on education is lower in Colombia compared with Mexico and Brazil, two countries with a large student population. Yet, public spending per student in higher education is high, which combined with the policy of no-cost recovery at that level, underlines its inequity. In a region where R & D spending is reduced, Colombia is at the lowest half of the comparison group. Scientific production is reduced and the rate of graduates in science and engineering indicates that the professional community in the sector is not dynamic. Lastly, Colombia, together with Peru, has the lowest Internet penetration rate, accompanied by a per capita existence of PCs that is less than half the rate of Chile. In sum, regionally, the advanced knowledge platform of Colombia—which is organized around the higher education system—shows weaknesses that are accentuated, even given the deficiencies of the average of the comparison countries (see Table I-4, below).

As shown in Table I-4, Colombia, as well as Chile, possesses a HE system with great institutional fragmentation, partly due to the proliferation of private universities and, to a certain degree because both these countries do not have large public universities. In an important dimension of quality, Colombia shows a particular weakness—an insufficient number of teachers with doctoral degrees.[59] On a positive note, in a key indicator of internal efficiency (ratio of graduates to total number of students), the three countries for which there is comparable information—Colombia included—are in a similar situation, showing rates that can be considered as internationally reasonably comparable, although higher, for example than those of Canada, Korea and Denmark which fluctuate among 4 and 5 students registered in the system per graduate.

In summary, a compared diagnosis of the Colombian higher education system reveals that Colombia has an unfavorable position within the region, lagging behind the countries of the "Southern Cone" as well as behind Mexico and Venezuela in most of the variables, and is at a level

59. It is interesting to observe that presently the number of professors with a doctoral degree in private universities is double the number than in public universities. (945 vs 547). See Jorge Hernán Cárdenas (2001) "*Alternativas para la Educación Doctoral en Colombia.*" In J. L. Orozco (comp.), op.cit., Vol. II, pp. 134–189.

TABLE I-2: COMPETITIVENESS AROUND THE YEAR 2000

Country	Population Millions 1999	GNI US$ billions 1999	GNI-PC US$ PPP 1999	HDI 1999		ATI 1999		Growth Competitive Index 2001	Innovation Hard Data Index 2001		Innovation Survey Data Index 2001	
				Value	Rank	Value	Rank		Value	Rank	Value	Rank
Argentina	37	276,1	11.940	0,842	34	0,381	34	49	3,55	29	3,79	50
Brazil	168	730,4	6.840	0,750	69	0,311	43	44	2,08	56	4,38	30
Chile	15	69,6	8.410	0,825	39	0,357	37	27	3,08	35	4,40	29
Colombia	42	90,0	5.580	0,765	62	0,274	47	65	2,03	57	3,47	63
Mexico	97	428,9	8.070	0,790	51	0,389	32	42	2,21	52	3,80	48
Peru	25	53,7	4.380	0,743	73	0,271	48	55	2,38	49	3,34	65
Venezuela	24	87,3	5.420	0,765	61	..	..	62	2,80	39	3,52	59

GNI: Gross National Income. The World Bank, World Development Indicators 2001.

GNI-PC: Gross National Income per capita expressed in currency with purchasing power parity (PPP). The World Bank, *World Development Indicators 2001*.

HDI: Human Development Index, Ranking of 162 countries. United Nations Development Program, *Human Development Report 2001*.

ATI: Advanced Technological Index. Place among 72 countries. United Nations Development Program, Human *Development Report 2001*.

Growth Competitiveness Index: measures the best estimates regarding the growth perspectives of the countries taking into account the strength of the institutions and its economic policies. Place among 75 countries. World Economic Forum (2001) *The Global Competitiveness Report 2001–2002* Innovation hard data Index: Measures intensity of economic innovation based on hard data in relation to patents registered in the USA and higher education enrollment. Place among 75 countries. World Economic Forum (2001) *The Global Competitiveness Report 2001–2002* Innovation Survey Data Index: Measures intensity of economic innovation based on the responses to a group of questions provided by entrepreneurs and CEOs in relation to national technological level, role of innovations in the generation of revenues, corporate investment in R&D, and local collaboration between universities and industries. Place among 75 countries. World Economic Forum (2001) *The Global Competitiveness Report 2001–2002*.

TABLE I-3: PLATFORM OF ADVANCED KNOWLEDGE 1997–2000

Country	Educational Average Population 15 years & more 2000	Gross Rate HE 1997	Populat. 25 years and more with some HE 2000	Public Expend. % GDP 1999	Expen × tertiary student as % IBN 1997	Science and Technol. Expend. as % GDP	Publications Science and technology Average 1995–1997	Natural sciences and Engineer Graduate Rate % populat. 24 years 1997	Interne users × 10.000 Inhabit. 2000
Argentina	8,8	36	19,7	3,1	19,9	0,38	1.944	1,5	243
Brazil	4,9	15	8,4	4,7	..	0,76	3.511	1,7	294
Chile	7,6	32	15,8	3,3	20,6	0,68	808	2,5	526
Colombia	5,3	17	9,9	3,0	35,4	0,41	178	1,8	160
México	7,2	16	11,3	4,4	46,8	0,42	1.758	2,7	297
Peru	7,6	26	22,4	2,5	15,4	..	..	..	159
Venezuela	..	..	18,0	4,9	..	0,89	398	..	393

Column 1: UNDP, *Human Development Report 2001*
Column 2: The World Bank, *World Development Indicators 2001*
Column 3: Barro and Lee, http://www.cid.harvard.edu/ciddata/ciddata.html
Column 4: The World Bank, *World Development Indicators 2001*
Column 5: The World Bank, *World Development Indicators 2001*
Column 6: Science & Engineering Indicators 2000
Column 7: Science & Engineering Indicators 2000
Column 8: Science & Engineering Indicators 2000
Column 9: International Telecommunications Union (2000) *Basic Indicators*

TABLE I-4: HIGHER EDUCATION INDICATORS AROUND 1995

Country	Average No. Of Students/ University	Professors w/ doctorates (%)	Ratio of Graduates/total enrollment	HE Public Expenditure % GDP	Unit Cost in Public Universities (US $1994)
Argentina	9.407	12,0[a]	..	0,58	2.670
Brazil	8.218	22,4[b]	..	0,76	6.997
Chile	3.022	12,5	6,77	0,51	1.855
Colombia	2.506	2,2	6,99	0,86	3.405
Mexico	10.191	3,5	6,75	0,40	1.065
Peru	6.922	..	..	0,35	610
Venezuela	12.576	..	..	1,18	3.353

Source: Carmen García G. (1996) *Situación y Principales Dinámicas De Transformación de la ES en América Latina* Column 3: based on UNESCO, *Statistical Yearbook 1999*

a. Only Universidad Nacional de Buenos Aires

b. Only universities with institutional public funding

similar of that to Peru. However, Peru shows significantly higher participation rates than Colombia but with lower unit public expenditure per student.

We can conclude from the above that if the educational, scientific, and technological capacities of Colombia were systematically compared within a broader international context—including countries of southeast Asia, eastern and central Europe, and countries of the south of Western Europe—its position would appear even weaker. Indeed, in an exercise of that nature, four countries alone—Argentina, Brazil, Chile and Mexico—occupy the bottom rankings in a Technological Capacity Index, behind Malaysia, Greece, Portugal, Spain, the Czech Republic, Hungary, New Zealand, Korea, Ireland, Holland and Finland.[60]

Causes

What are the causes of low performance within Colombian higher education? As mentioned above, the preliminary report of the ASCUN Working Group gives a comprehensive list of these causes. However, they need to be specified, arranged in an explanatory order, and expanded and explained, even if only in a schematic way.

Without entering into the historical reasons driving the development of Colombian higher education,[61] it is possible to identify, as a more direct and more immediate cause, the underlying economic-political framework as the major issue hindering higher education's development. This framework is organized and regulated around three main points:

- A vertically disjointed system horizontally divided among the public and private sectors, with weak links between them.
- A public sector that operates without incentives (or with perverse incentives) to grow and to improve the quality and the equity of the services it offers.
- A highly fragmented private sector that, at its worst, offers services of poor quality and whose suppliers are not eliminated by market forces.

60. José Joaquín Brunner (2001) Chile: *Informe e Índice de Capacidad Tecnológica;* Universidad Adolfo Ibáñez, Santiago de Chile.

61. See for example, Eduardo Aldana (2001) "Tendencias, retos y mitos de la educación superior en Colombia." En J. L. Orozco (comp.), Vol. II., pp. 203–215.

Separation

The vertical separation and the horizontal division[62] have the effect of hindering the emergence of a proper higher education system; rather, what appears is an institutional framework that is lacking specific form and is difficult to coordinate through the usual mechanisms that operate these systems (the law, policies, administrative commands, market forces, interests of the academic corporation, or a combination between two or more of these mechanisms). The language in Colombian documents on higher education say that the system lacks an identity and that it does not operate "as articulated, harmonic and with common objectives."[63] Still without having such an integrated concept of the system as it is expressed there—even accepting that there is usually tension, competition and conflict—the reality of Colombian higher education is that it is highly fragmented.

In the vertical sense, the type of higher education defined by Ordinance 80 of 1980—intermediate professional, technological, university, and advanced training—has not given rise to an interconnected group of institutions that supply graduates according to the needs of the labor market and in accordance with the significant evolution of knowledge. On the contrary, a heterogeneous framework of institutions has been forming, of imprecise limits, arranged in a scale of upward socio-academic prestige, subject to a scaling effect ("to grow into universities") and whose link with the market and with knowledge is habitually weak.

The result is that today, Colombia has 95 universities and 70 institutions called "universitarias," all small in average size (4.242 students). While on the one hand these institutions of "higher" learning concentrate the demand because of the status of their certificates, on the other hand, technical and technological institutions languish in their inferior status. As stated by the Comisión de Articulación del Sistema de Educación Superior: "In this hierarchy of institutions and knowledge, it is evident that the current technical education system and the technological institutions occupy the lowest position: they have low social and educational status, they can neither develop nor secure their own identity, nor can they define their own parameters of excellence. They are condemned to emulate universities and to be considered second class institutions, providing terminal training for occupations requiring relatively low qualifications."[64]

In sum, in the vertical differentiation of a higher education system, an essential element is to endow the system with enough variety in supply so that it may respond flexibly and adapt to the changing requirements of the labor market and to the evolution of knowledge. Unfortunately the Colombian HES presents a picture of disconnection with an inflated top and a thin base with low social recognition.

Dualization

The horizontal division of the institutional framework accentuates the skewed vertical configuration of the system. On one hand, public sector institutions enjoy relative autonomy—with strong traditions and corporate interests, and weakly coordinated government policies (budget appropriations, basically). On the other hand, the private sector is highly heterogeneous in its internal structure, and runs the gamut from high quality institutions serving the elite to institutions of very poor quality. The market, with virtually no government intervention by way of regulatory policies, coordinates the private sector, although recent legal and administrative regulations that control access to the market have been introduced (minimum standards and accreditation of certain programs).

The dualization (division) of the public/private sectors inhibits the development of a horizontally integrated system, limits the effects of competition, forces discriminatory use of public resources to higher education, generates multiple inconsistencies and confusion, segments supply in function of

62. The terms "vertical" and "horizontal" are used as employed by Burton Clark (1983) in: *The Higher Education System. Academic Organization in Cross-National Perspective,* University of California Press, Berkeley.

63. Comisión de Articulación . . . , op.cit., p. 39.

64. Victor Manuel Gómez Campos (2001) "*Necesidades de alternatives a la universidad tradicional.*" In L. E. Orozco (comp.), op.cit., Vol. II, pp. 250–251.

the institutions' social selectivity and the economic power of the students and blocks the ability of tertiary education to plan and respond to national development needs.

As in most Latin American countries with a robust HE private sector, Colombia's private sector has emerged stratified by market forces. The weak regulatory framework has given way to the proliferation of institutions. Market information is limited and competition with the public sector is uneven due to its policy of "here-no-tuition-is-charged" and, at the same time, to the historical concentration of fiscal resources in public institutions. In short, the vertical separation coupled with the horizontal division results in a heterogeneous, inorganic institutional platform, ill adapted to the needs of society and to the labor market, governed by an incoherent framework and with tremendous variations in the quality and relevance of their program offerings.

Immobility: Follow-up Remarks

Why have the two sectors—public and private—been unable to move in the direction necessary to transform the system into one with quality, relevance, equity and efficiency? The two chief factors mentioned earlier—(a) a public sector that operates without incentives (or with perverse incentives) to grow and to improve the quality and the equity of the services it supplies, and (b) a highly fragmented private sector that, at its worst, offers services of poor quality whose suppliers are not eliminated by market forces—complete the picture of the factors explaining the difficulties impinging on the development of higher education in Colombia. These two factors, which are related to the incentive structure that dictates the systems institutional behaviors, are directly linked to the underlying politico-economic framework that regulates the operation and the expansion of higher education, and controls the distribution of higher education opportunities.

Indeed, the incentives for the development of institutions are misplaced. Public institutions are financed by means of historical budgets. Such budgets are insensitive to the institutions functions, to their degree of efficiency, to the relevance of their programs, to the results of accreditation, or to any other factor that could induce universities to improve their performance.[65] In the last analysis, budgets are determined based exclusively on historical elements, such as enrollment numbers (and indirectly on the costs of the programs offered) and on external elements, such as fiscal policy and the economic cycle, both of which are not under the control of the institutions. In other words, there are neither rewards nor punishments for public institutions. Neither are there government "signals" transmitted through the budget allocation mechanism. Like Ayala de Rey points out: "The financing of public institutions based on historical patterns causes the state to give resources without having control, therefore, with no accountability."[66] Additionally, the assignment is rigid, because a high proportion is spent on the payroll of personnel and on fixed expenses of the institutions, leaving very little for investments, cross subsidies, and new initiatives and innovations.

Under these conditions, the only road available to public institutions to secure additional resources that are needed to expand and improve is to put pressure on the government. This pressure can take the form of non-transparent budget negotiations with the government, the "clientelistic" mobilization of political resources or direct use of force through riots and protests.

On the contrary, within this framework there are no stimuli to improve equity, quality, and efficiency of the public universities. For example, equity is supposed to be paramount in the public sector, yet at the present time, two out of three students enrolled come from the richest quintiles (IV and V), while only 17% come from the poorest quintiles (I and II). Those who take full advantage of free university studies are the children of the wealthy who, in due time, will also obtain the highest

65. See Juan Carlos Echeverri (2001) "*Financiamiento para la equidad, calidad y retos de la educación superior en Colombia.*" In J. L. Orozco (comp.), op.cit., Vol. I, pp. 9–16. Hugo López Castaño (2001) "La financiación de la educación superior. . . ." In J. Orozco (comp.), op.cit., Vol. II, pp. 109–33. Ulpiano Ayala (2001) "*Notas sobre la financiación de la educación superior en Colombia.*" In J. L. Orozco (comp.), op.cit., Vol. II, pp. 190–199.

66. María Victoria Ayala de Rey (2001) "*Inadecuada financiación en la educación superior*" (mimeo).

reward in the labor market. Additionally, enrollment in public institutions has been falling from 54.5% in 1970 to 30% today. At the same time, one out of every three students enrolled in private institutions—which account for 70% of total enrollment—come from the poorest quintiles—I, II and III—and pay for their higher education training out of their own pockets (or from the family's pocket), in spite of the family's modest resources.[67] It is also important to note that only five or six percent of undergraduate students receive a loan or a scholarship.[68]

The incentives for private institutions are no better. Financed exclusively by the market through tuition and fees, they should, out of necessity, recruit their students from among the groups with higher income, in spite of the fact that in this respect they don't differ substantially from public universities (70.7% of students in the private sector come from quintiles IV and V, versus 63.1% of those in the public sector). Due to lack of reliable information about the programs and the quality of the institutions, the market does not discriminate sufficiently among institutions of medium or low quality. Only excellent institutions tend to be recognized as such. The lack of discrimination and the lack of information impede appropriate market sanctions for those institutions whose programs are deficient and therefore whose certificates hold little or no value for their graduates.

The fact that quality assurance mechanisms are still in their early stages of development and that the accreditation system is designed to reward excellence and not to recognize compliance with minimum standards, makes it even more difficult to identify, in a timely fashion, inadequate institutions and "to take them out" of the market. On the other hand, the government does not have the ability to grant economic stimuli to private institutions to improve their operation because fiscal resources are dedicated exclusively to public institutions.

Blocked Institutions

In the end, neither public policies, nor government regulation, nor current funding mechanisms or market forces seem to provide higher education institutions with the appropriate mix of incentives which will stimulate development, competition and regulation. On the contrary, institutions are forced to operate within a social space that is characterized by anomy, without any clear and stable norms, without accountability and without any consequence coming either from the Government or the market. Under these conditions the government ends up being powerless to carry out HE development policies and institutions are left on their own. Thus, the responsibility for change and innovation shifts to the institutions.

But, are HE institutions—with their own traditions, interests and governance systems—really able to reform themselves and the system? It seems doubtful that this is possible. In general, Latin American public universities do not have an academic elite with enough power or legitimacy to bring about the process of change. Nor do these institutions have a university knowledge-based dynamism—as in the case of research universities in the USA and Europe—that might produce a continuous current of innovations. The same is true of the public universities in Colombia.

Rather, the corporate interest of public HE institutions resides, on the one hand, in the power of academic bureaucracies, and on the other hand, in the faculty unions. According to an early 20th century Latin American tradition, this interest needs to be legitimized by means of voting procedures with wide participation by professors, students, graduates and employees, that gives institutions a political presence that they lack in other parts of the world. But it also creates the need of working out complex agreements and alliances and leads to continuous conflicts in the public universities. Under conditions of budgetary constraints they frequently end up in "a tie" situation or "veto" regarding the possibilities of change, i.e. in blocked institutions.

With the exception of elite private universities, private institutions operate under no better conditions even though they are free to manage their own matters and are not bound by the same

67. H. López Castaño, op.cit., pp. 113–115
68. Maria Victoria Ayala de Rey, op.cit., p. 4.

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strong traditions that limit efficiency in the public sector. Indeed, it is only the elite, private universities, under pressure from market forces, which have recently begun to develop systems of governance in which the faculty is recognized as "professionals" who need to participate in academic decisions and who are sufficiently flexible to respond to a changing environment. This combination generates favorable conditions for the emergence of innovative institutions, a bit like those entrepreneurial universities studied by Burton Clark in Europe.[69]

The situation in the majority of non-elite private institutions is very different. In most private institutions one person, or a group-proprietor, possesses the decision-making authority, academics take only a small role in the decision-making process, and market forces act only on the price but not on the quality of the services. These institutions are *blocked* in terms of their organization and their ability to change and transform themselves. They will change only if the leadership is open to new demands or willing to give up short-term profitability for investments that will pay off in the medium and long term.

New Challenges

The Colombian HES, as with the rest of Latin America, must not only face and overcome the limits of its own development, but it must also face the new challenges presented by globalization, by the scientific and technological revolution, and by the new methods through which knowledge is generated and used in all sectors of society.[70] Particularly the HES should take note of the changes that are occurring in the access to information, the use of knowledge and the labor market.[71]

Access to Information

Throughout history, information has been limited and difficult to access. While the printing press brought about a revolution by allowing text to be easily reproduced, it was not until the twentieth century that books and newspapers were easily accessible to the masses. Today the picture is totally different; information is increasingly abundant and easy to obtain, as evidenced by the Internet and the World Wide Web. Currently, the Internet is growing at a rate of seven millions pages per day and it is estimated that by the year 2002, there will be 8 billion electronic pages in the Internet. At the same time, the number of people who connect to Internet, although still a minority in the world and highly concentrated in the countries of the north grows at a sustained rate and is estimated to reach one billion in the next five years.

The problem at the present time is not where the information is found but how to establish access without exclusivity and, at the same time, how to teach Internet users how to select, evaluate, interpret, classify, and use that information effectively. Higher education institutions are no longer the primary providers of information and consequently should modify their operation. The challenge for higher education now is to determine how to provide people with both general training and the capacity to think in new ways and to negotiate the vast amounts of information available. An obstacle to this is the curricular tradition of the Latin American University, which is strongly biased to transmit detailed information and will need to be rethought and revised.

Knowledge Management

A second context that is changing quickly is the context of advanced knowledge. Until recently, the amount of advanced knowledge was relatively small and stable, which facilitated its transmission and

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69. See Burton Clark (1998) *Creating Entrepreneurial Universities. Organizational Pathways of Transformation; IAU-Press-Pergamon, Oxford.*

70. See L. E. Orozco (comp.), op.cit., articles in Vol. I.

71. The following is a summary of sections in José Joaquín Brunner (2001) "*Tiempo de innovar; politicas innovativas.*" In J. L. Orozco (comp.), op.cit., Vol. I, pp. 86–104.

use. Today however, increases in knowledge and the speed with which it can be transmitted are astonishing as shown in the following examples:

- Chemistry: Between 1978 and 1988, the number of known substances grew from 360 thousand to 720 thousand, reaching 1.7 million in 1988. In addition, the publications in this discipline have grown spectacularly: from the beginning of the 1990s, more than 1 million articles have appeared in specialized magazines every two years.
- Biology: while the method used to determine the base sequences of DNA in 1977 allowed scientists to determine the sequence of 500 bases per week, today that same method, more sophisticated and automated, allows scientists to determine one million bases per day.
- History: In just two decades—1960 to 1980—this discipline produced more publications than were produced from the beginning of written history (as such, from the classic historiography of Greece).

Considered as a whole, it has been calculated that at the present time, knowledge (of a disciplinary base, published and registered internationally) is duplicated every five years; it has been estimated that by the year 2020 knowledge will be duplicated every 73 days. Under these conditions, only those individuals who can identify, select, examine, combine, and use these nuclei of knowledge will be recognize as high-performing analysts in the market. All this presents serious challenges for education as a whole and for universities in particular. Who will be tomorrow's synthesizers of knowledge? With respect to professional training, what skills will be necessary, when, and other what conditions? How will knowledge be organized in academia?

Changes in the Labor Market

Throughout history higher education has had as its goal the preparation of youth for adulthood, specifically, preparation for the world of work based on the use of advanced knowledge. Today it is evident that education is facing a rapidly changing environment and that this task is becoming more difficult for several reasons.

In the first place, changes are taking place in the structure of employment, that is to say, in the distribution of occupations among different sectors, with a tremendous increase in the service sectors.

In the second place, the content of occupations is changing, generating new competencies and knowledge. Not only more are more competencies required but frequently they are new and different, which puts in check the educational systems and vocational training.

And thirdly, one of the main "products" of the modern university—the group of advanced professionals, scientists and technicians that Robert Reich calls "symbolic analysts"—will become global and will encounter more complex problems, for which university training is often insufficient. Indeed, as Reich points out, this group acts in a frontier situation "replete with unidentified problems, unknown solutions, and untried means of putting them together (where) mastery of old domains of knowledge isn't nearly enough to guarantee a good income. Nor, importantly, is it even necessary. Symbolic analysts often can draw upon established bodies of knowledge with the flick of a computer key. Facts, codes, formulae, and rules are easily accessible. What is much more valuable is the capacity to effectively and creatively use the knowledge. Possessing a professional credential is not a guarantee of such capacity. Indeed, a professional education which has emphasized the rote acquisition of such knowledge over original thought may retard such capacity in later life."[72]

All this outlines new challenges for university training, in case the university wants to retain its prestige and influence in the preparation of the personnel who will occupy the positions located in the top of the intellectual system of the emergent global order.

72. Robert Reich (1992) *The Work of Nations;* New York: Vintage Books, p. 182.

In conclusion, it can be said that higher education is facing: (i) new demands originating from the division of labor; (ii) a new knowledge context that it is experiencing a true explosion, and (iii) a system of information networks that makes abundant a resource that until recently, was scarce. In those three dimensions, therefore, the external requirements—of an environment that is rapidly moving—places tension on the response capacities of the institutions of higher education of Latin America, and of Colombia in particular.

Political Options

How then can Colombian higher education cope with its 20th century agenda—still unfulfilled and simultaneously cope with the emergent agenda of the 21st century? How can it combine the tasks pending from the first one—to improve coverage with equity, quality with relevance, efficiency with effectiveness—and at the same time approach the challenges of the second one, preparing students to thrive in a global, knowledge based economy in which the labor market is becoming more and more complex and undergoing rapid change? For Colombia, as for the rest of Latin America, the burden of such a complex issue—to combine two demanding agendas—is in how to generate conditions so that the institutions themselves change and assume the leadership of the transformation of higher education because these conditions will not be produced by policy dictum nor will they arise from within the system blocked by its own inertia.

Rather, it falls to government officials to create an appropriate framework so that the institutions can come out of their current blocked state. The Government's main objective and responsibility is in fact to generate an appropriate mix of incentives within which the system and the institutions can develop in the desired direction.[73] Therefore, the challenge resides in building this context of incentives and in modifying the current underlying framework of political economy that organizes the operation and regulates the expansion and distribution of the opportunities for higher education, which we analyzed earlier.

In order to do this, it is necessary to select and combine a group of instruments that modify the current coordination modes of the HES, starting with its financing mechanisms and procedures. On this last topic, there is abundant literature and a wide range of reform experiences that were carried out during the nineties.[74]

Basically, what should guide the design of a new financing model for higher education? A new model could be organized around two major axes. On one hand, it is necessary to shift from a block-grant type of university funding to financing different university functions; particularly, pre and post-graduate teaching, research, extension and institutional development. On the other hand, it is necessary to shift from public funding allocated through the national budget in agreement with a historical pattern of distribution among public HE institutions, toward diverse sources of funding that use a variety of mechanisms to stimulate the accomplishment of desired results.

Table I-5 summarizes some of the mechanisms and procedures that can be used to generate a scheme of diversified funding by function.

If some combination of the above suggested instruments could be used in such a way as to change the present institutional inertia, an effective transformation of the incentive structure would occur both within HE institutions and the Colombian HES in general. While many outcomes are possible, one could expect the following desired effects:

- ☐ Greater diversification of supply and increased attention to demand, with a gradual impact on improved relevance of study programs.

73. See The World Bank, Education Group, Human Development Network (2001) *Constructing Knowledge Societies: New Challenges to Tertiary Education*, Vol II, 4.3.

74. See Bruce Johnstone, A. Arora and W. Experton (1998) *The Financing and Management of Higher Education: A Status Report on Worldwide Reforms*; The World Bank (document NO. 19129).

TABLE I-5: FINANCING HIGHER EDUCATION INSTITUTIONS BY FUNCTION

Function	Mechanisms/procedures	Commentary
Research	☐ Subsidies assigned to projects through competitive funds, to researchers evaluated by publications or patents, to groups or teams of excellence, to inter-institutional initiatives or bound to public priorities, etc. ☐ Private financing through contracts, seed capital or risk capital, co-participation and joint ventures. ☐ Sale of consulting services, laboratory testing, technical support, technological products, etc.	☐ Every time a public subsidy exists, it should be peer-evaluated by projects and results. ☐ In dealing with applied research and experimental development, there should be a private counterpart for public funds.
Undergraduate Teaching	☐ General Rule: Payment of tuition fees associated to a wide scheme of student loans and scholarships. Such schemes admit a variety of modalities.[75] Another option is cost recovery through the tax system. ☐ Subsidies related to student loans and scholarships can be used to develop certain areas/levels of study.	☐ Loans and scholarships should be based on socio-economic needs and academic merit. ☐ Loans and scholarships should be available for students of public and private institutions that guarantee a sufficient level of quality and accountability. ☐ Institutions that enroll the "best students" can be rewarded by means of subsidies linked to teaching. ☐ Funding directed to educational function requires an operating quality assurance system and a system of public information.
Post-graduate Teaching	General Rule: Payment of tuition fees associated to a scheme of student loans and scholarships.	Eligible programs should have been previously submitted to peer evaluation.
Extension	General Rule: Cost recovery through sales of services or by agreements with private parties. Another possible source: tax exempted private donations. In those cases that extension activities are considered a public good, public subsidies should be granted competitively and results evaluated.	
Institutional Development	Subsidies granted according to formulae, target contracts, competitive funding or funding linked to results. Another possible source: tax exempted private donations.	Government can also use institutional development funds to consolidate or to fuse institutions or to obtain high-priority objectives linked to, for example, health reform or education reform, regional development plan, etc.

75 "See Jamil Salmi (2000) *Student Loans in an International Perspective: The World Bank Experience.*"

- ☐ Progressive improvement in equity, when subsidies are directed to students from relatively poor homes and away from students who come from wealthy homes.
- ☐ Growing pressure to improve the quality of education generated by institutions competing for students and improved mechanisms of evaluation, accreditation, and funding through loans and scholarships.
- ☐ Improved access to public information and greater accountability of the institutions.
- ☐ Overcoming (at least partial) the public/private divide when all the institutions must compete under the same rules and conditions.
- ☐ Gradual development of a bolder and more innovative culture when institutions are forced to diversify their funding and are forced to more intense competition.
- ☐ More rapid institutional adaptation to environmental changes in order to remain competitive.
- ☐ The possibility that institutions generate more interesting and productive links and interfaces with the private sector, the government and the civil society and, by this means, produce relevant results and additional income to develop institutional policies based on "cross subsidies" in favor of innovative programs.
- ☐ Public policies that allow the government "to intervene at a distance" but with improved effectiveness.

Annex II

Institutional Analysis of the Tertiary Education Sector

Prepared by Martha Laverde

Introduction

Compared to other countries in the region with a weak governance system (Venezuela, Ecuador and Peru for example), Colombia has a fairly large number of government departments and agencies which guide and regulate the operation of the higher education system (Ministry of Education, ICFES, CESU, FODESEP, CNA, etc.). But the multitude of agencies does not amount to a well articulated governance system. In fact, the development of higher education in Colombia is hampered by several governance issues.

There is a lack of clarity in the role of the various agencies, resulting in a significant duplication of responsibilities. For instance, both ICFES and the Department of Higher Education within the Ministry of Education have authority for policy making and planning and the respective areas of responsibility are not defined in an unambiguous way. There is a tendency, whenever a serious problem arises, to create a new institution or mechanism instead of reforming the existing institutional setup. For example, even though the Higher Education Council (CESU) is responsible by law for overseeing the performance of higher education institutions, a special Inspection Commission was established in 2000 to control and sanction poor performing universities. Similarly, in the current efforts to expand student loan coverage, the Government is looking at the creation of new mechanisms rather than the possibility of transforming the existing program managed by ICETEX.

Despite several attempts in the past few years to develop a long-term vision for the future of higher education in Colombia (Committee of the 40 Wise Persons, "Sintegración" etc.), successive governments have been unable to produce a well formulated development plan. There is a lack of planning in terms of academic programs and geographical location of tertiary education institutions, resulting in the proliferation of similar disciplines, insufficient graduates in technologically oriented programs, and a major concentration of institutions in Bogota, Medellin and Cali.

Despite the existence of a national accreditation agency (CNA), there is insufficient regulation of the quality of most private tertiary institutions. In addition, there is little clarity in the definition

of different types of tertiary education institutions. For example, there are no obvious criteria to distinguish among technology universities, technology institutes and technical institutes. There is limited publicly available information to help students and families assess the performance of private institutions.

Even though public universities are predominantly funded by the state, they are not subject to strict accountability mechanisms with respect to their use of public resources and the quality of their outputs. The democratic election of rectors in public universities introduces significant political interferences which inhibit the capacity to innovate and undertake meaningful reforms in response to changes in the tertiary education environment. Many private universities are run like family businesses, with very limited institutional capacity.

These facts illustrate some of the factors which characterize the institutional conditions within which Colombian higher education evolves. This paper aims to provide both a description and a basic analysis of those conditions in order to point to institutional adjustments which would allow better management efficiency in the high education system for any future operation.

Map of the Institutions

Policy-Making and Oversight Agencies

Law 30/92 and, prior to that, Decree 80/80, regulated and organized the higher education system on two foundations: one was the components—intermediate, technological, university and advanced formation. The other was the form given to the organizations of the agencies in the system. This chapter provides a map of the institutions which manage Colombia's higher education today.

1. National-Level Institutions

The national level institutions have functions in policy making (the Ministry MEN, CESU, and CNDM), planning (MEN), development (ICFES and FODESEP), regulation (MEN, CESU), inspection and supervision (MEN), quality control (CNA, ICFES, CNDM) and granting of student loans (ICETEX). Table II-1 describes the national-level institutions and their functions, and indicates the legislation which governs them.

2. Relationships Among National Level Higher Education Institutions

As Diagram 1 shows, Colombia's higher education develops through the activities of a complex series of relationships between national order agencies which include State agencies, advisory councils, standing commissions and special funds. Policy-making, planning, development, regulation, inspection, supervision and control are distributed among these organizations under the 1991 Constitution, Law 30/92 and Law 115/94 (The Education Law).

Institutions from other sectors—labor, finance and planning—also have responsibilities in the development of higher education. One example is SENA, a Ministry of Labor agency which not only plays a role in strengthening intermediate and higher technical and technological education, but is also responsible with ICFES for setting up the Professional and Occupational Information and Guidance System, which is intended to help rationalize the formation of human resources at national and regional levels. Another is FINDETER, a Ministry of Finance agency authorized to make education loans to higher education establishments.

CESU's role includes coordination, planning, and advisory activities; and in the area of administration appoints the members of CNA, and CNDM. ICFES acts as the secretariat for CESU.

In administrative matters the MEN chairs the Boards of CESU, ICFES and ICETEX and represents the State in the FODESEP Members Meeting. The Minister of Finance is also a member of the Board of Directors of ICFES.

It should be noted that SENA, in technical programs managed by the Ministry of Labor, acts as a parallel system of non-formal formation under the SENA National Council, SENA is autonomous in matters related to the creation, maintenance, evaluation and accreditation of

TABLE II-1: INSTITUTIONS BY FUNCTION, LEGAL NATURE AND REGULATORY FRAMEWORK[76]

Name	Functions	Legal nature
MEN Tertiary Education Division (DES)	☐ Guides and directs policies, plans and programs for the development of Tertiary Education. ☐ Guides and directs regulation of the service and technical criteria for presentation ☐ Directs relations with regional agencies. ☐ Directs relations with other sectors. ☐ Decides on issues, institutions, inspection and supervision. ☐ Coordinates participation and representation in international matters. ☐ Appoints secretarial officers for international organizations. ☐ Structures draft legislation. ☐ Defines criteria for the allocation of sector resources. ☐ Organizes teams to work on sector matters.	The Minister, along with the President, is the administrative authority established by law.
CESU	☐ A technical, non-political agency that plans, coordinates, makes recommendations and serves in an advisory capacity to MEN. Specifically, CESU: ☐ Sets policies and plans, ☐ Recommends general standards and procedures, and ☐ Proposes mechanisms to evaluate the academic quality of institutions and programs.	A senior academic advisory body; accountable to MEN.
CNA	☐ Quality control: Through accreditation, the CNA's role is to ensure that institutions meet the highest quality requirements and fulfills their stated objectives.	Advisory body attached to CESU
CNDM	☐ Advises CESU on: ☐ Policies and plans to create doctoral programs, ☐ Criteria for accreditation of graduate programs, and ☐ Criteria for national and international cooperation.	Advisory body attached to CESU
ICFES	☐ Executes government policies and decisions on Tertiary Education matters and acts as secretariat for CESU. ☐ Serves as an information and documentation center. ☐ Supports and undertakes research and studies on quality, relevance and coverage. ☐ Encourages cooperation between institutions and the international community. ☐ Develops self-evaluation processes for institutions and academic programs.	State Agency accountable to MEN; its main functions are to: – Encourage, monitor, and supervise HEI's, – Implement and evaluate policies in an effort to consolidate the Tertiary Education system, and support growth with quality.

(*continued*)

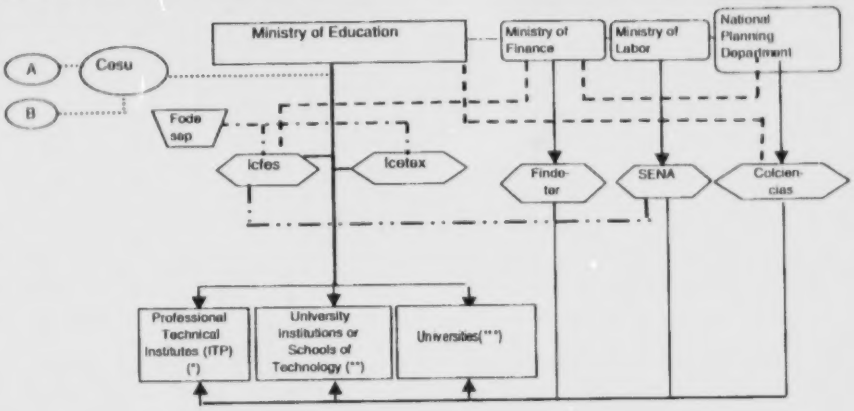
76. ICFES, Nuevo Compendio de Normas sobre la Educación Superior, Pacheco; Ivan F. Bogotá, October 2001.

TABLE II-1: INSTITUTIONS BY FUNCTION, LEGAL NATURE AND REGULATORY FRAMEWORK (*Continued*)

Name	Functions	Legal nature
	☐ Encourages training for teachers, researchers, managers and administrators; Cooperates in inspection and supervision. ☐ Provides public registration of education establishments. ☐ Advises and supports academic, legal, administrative and financial aspects of institutions in the system. ☐ Supports and develops activities which enable the Regional Committees to function. ☐ Cooperates in the organization and functioning of SUE. Supports CNA, CNDM and the Consultative Commission for Tertiary Education Institutions.[77] ☐ Accepts and validates foreign degrees. ☐ Holds State examinations and publishes results, giving the public the opportunity to exercise social control over education quality.	
FODESEP	☐ Provides financial support to institutional development through financing scientific, academic and administrative projects, infrastructure improvement, and equipment purchases. ☐ Acts as a financial intermediary between institutions and the financial system. ☐ Manages project funds for institutional projects. ☐ Ensures that institutions share resources, information, academic formation etc. ☐ Supports and promotes local, Departmental, regional and national integration of Tertiary Education institutions and development of cooperation programs between them and institutions abroad. ☐ Takes in funds from members and grants loans. ☐ Provides technical assistance services to members.	Mixed economy agency attached to MEN, organized on the principles of economic solidarity.
ICETEX	☐ Provides and maintains funding for student matriculation and upkeep through the provision of student loans. ☐ Guarantees loans of the financial sector to poor students. ☐ Selects beneficiaries for international cooperation scholarships.	State agency attached to MEN

77. Comisión Consultiva de Instituciones de Educación Superior, consists of five members from academia and serves as a consultative body to the Ministry of Education in matters related to the creation of new Tertiary Education institutions, the opening by existing institutions of branches, or Seccionales, in other cities, and the transformation of technical and technological institutions into university institutes.

FIGURE II-1: RELATIONS AMONG INSTITUTIONS IN THE HIGHER EDUCATION SYSTEM



A = CNMD advises CESU in its area.
B = CNA members are appointed by CESU
Conventions:
..... Advisory Functions
– · – · – Financial relationship
– – – – Administrative relationship / participation in Management Boards
— · · — Technical relationship. Sharing of responsibility for professiopnal and occupational information.

(*) Instituciones Técnicas Profesionales (ITP): these organizations are authorized to offer programs of training in operational and instrumental occupations and specialized aspects of particular fields of activity, without neglecting the humanistic facets proper to this level of education.

(**) University institutes/technology schools are authorized to provide programs in occupations and academic formation in professions or disciplines and diploma programs.

(***) Universities recognized as such and other institutions which can accredit that they act with criteria of universality in scientific or technological research, academic formation for disciplines or professions and the production, development and transmission of knowledge and universal and national culture.

programs, and even in inspection and supervision, which the Constitution assigns to the MEN as a function not subject to delegation.[78]

3. Regional Institutions (Departmental, Metropolitan Districts and Municipalities Levels)

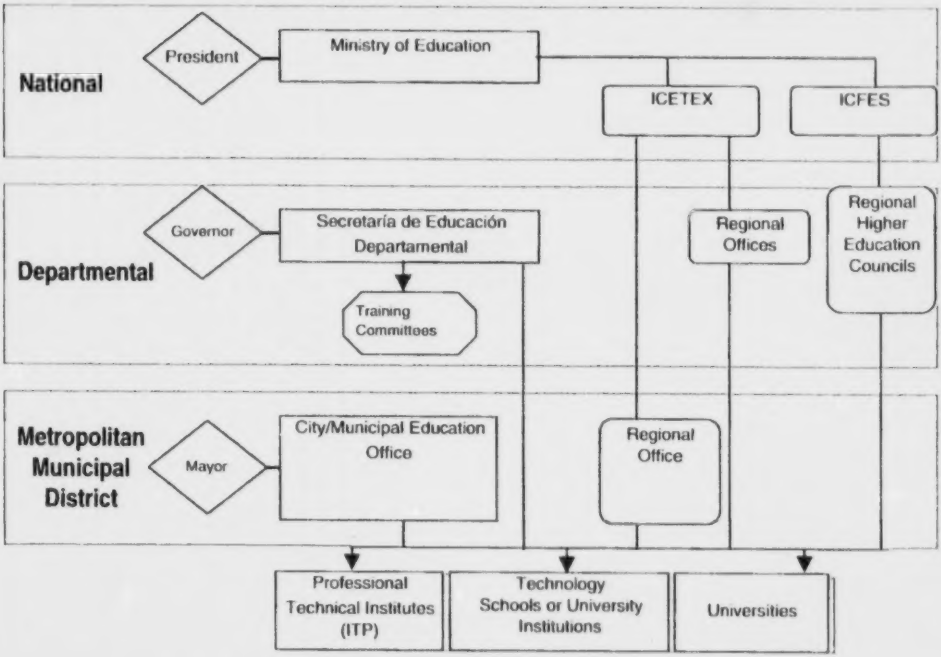
The Constitution describes Colombia as a "unitary and decentralized" republic, and guarantees autonomy to the regional entities in the Departments, Metropolitan Districts and Municipalities. It also provides for the possible creation of administrative and planning regions, involving two or more Departments, Law 30/92 says that one of the purposes of higher education is to promote national unity, decentralization, regional integration and inter-institutional cooperation.

The evolution of higher education has been both slow and uneven. This can be appreciated from two sets of facts: one is that the level of enrolment in Bogota is 32.8%, in Atlántico 18.5%, in Antioquia 17.6%, in Santander 14.4% and in other Departments, less than 13%. The other is that 83% of enrolments come from the top 40% of income groups.

In this context, higher education has a variety of local institutions engaged In planning, execution and in some cases, regulation. Figure II-2 shows the interlocking of national, departmental, metropolitan and municipal levels of action.

78. Bases Para Una Política De Estado En Materia De Educación Superior, ICFES, Bogotá, March 2001.

FIGURE II-2: GEOGRAPHICAL LEVELS AND LINES OF AUTHORITY



At the national level, the DES advises the Minister but has no powers over the Departmental Education Offices. Neither the 21 ICETEX Regional Offices nor the 5 CRES—which come under the coordination of the ICFES Planning Division and are composed of the Rectors of each region's higher education institutions—have a formal or regulatory relationship with the Departmental Education Offices. This means that any coordination between them is entirely a matter of good will on behalf of the current administration.

It should be noted that the meaning of "region" is not uniform: for ICETEX, a 'regional' office corresponds to a Departmental Office, while a CRES 'region' is a geographical grouping which includes several Departments.

Higher Education Institutions. The Supply in Higher Education

1. Institutions by Ownership—Public and Private

Of the 311 institutions of higher education, 94 are public, 210 are private and 7 have a "special regime."[79] Thus the public or State institutions comprise 30.2% of the system and are basically funded from the national budget, while being defined as autonomous in preparing and managing their own budgets. Only Congress, a Departmental Assembly, a Metropolitan Council or a Municipal Council or a regional entity may create one.

The private establishments form 67.5% of the system, and are private-law creations of individuals or corporate entities, accredited by CESU. They may be classified as "common utility" or non-profit organizations; 36% of the total are organized as corporations and 31.5% as foundations.

79. Institutions of Professional Education and Military Intelligence.

2. Institutions by Academic Characteristics
These classifications are defined as follows:

- Universities: recognized institutions which accredit universality in their scientific or technological research: academic formation in professions and disciplines and production, development and transmission of knowledge and universal and national culture.
- University Institutes/Technology Schools: institutions authorized to provide formation programs for occupations or disciplines and specialized programs.
- Technology Institutes: Art. 213 of Law 115/94 includes these establishments as part of the higher education system. They are authorized to offer programs in occupational formation, and academic formation in disciplines, and specialized programs in their particular fields of activity.
- Technical Institutes: Authorized to offer programs in operational and professional occupations and related specialized programs, without neglecting the humanistic elements proper to this level of education.
- Special Regime. This is different to the special regime in the breakdown by origin, and comprises the 6 military schools, 2 institutes and 4 SENA establishments.

1. Institutions by Type of Degree Offered
Decree 80/80, the predecessor of Law 30/92, organized higher education on the basis of the modes of formation offered by particular types of institution and particular teaching content. In the ICFES information system, however, programs offered are classified by the type of degree.

These modalities are grouped into the following classifications:

- Undergraduate studies, preparing the student for an occupation or profession.
- Technological, i.e. the education for practical activities. Research in this area is designed to create and adapt technologies. The degree obtained is "Technologist."
- Technical-Professional: this mode is mainly practical for specific ancillary or instrumental work. The degree obtained is "Technical Professional."
- University, characterized by broad social and humanistic content with an emphasis on scientific principles and research. The degree obtained is "Professional."
- Technology Diploma. These programs support the perfection of a technology. The degree obtained is "Technologist."
- Technical-Professional Diploma. These programs offer additional preparation for an occupation.
- Post-graduate studies seek to provide complementary professional preparation (diplomas) or advanced scientific training and research.

TABLE II-2: ACADEMIC CHARACTER

Classification	No	% of total
University	101	32,5
University Institution/Technology Schools	85	27,0
Technology Institute	59	19,0
Technical Institute	52	16,7
Special Regime	14	4,5
Total	311	100,00

Source: ICFES, Sistema Nacional de la Información de la Educación Superior, Instituciones registradas, 1999, website: www.icfes.gov.co

TABLE II-3: TYPE OF DEGREES OFFERED

	No.	% of total
Diploma	4.001	38.1%
University	3.785	36.0%
Technological	1.378	13.1%
Technical/Professional	798	7.6%
Masters	322	3.1%
Technology Diploma	138	1.3%
Doctorate	47	0.5%
Technical/professional diploma	35	0.3%
Total	10.504	100%

- ☐ Diploma programs complement initial professional preparation in the fields of technology, science, humanities, arts or philosophy. Applicants must already have a first degree ("professional") or degree in some academic discipline.
- ☐ Masters programs broaden and deepen knowledge for solving problems of a given discipline or set of disciplines or professions, and provide the student with the basic skills required for research.
- ☐ Doctorate programs concentrate on the formation of researchers at advanced level.

5. Institutions by Geographical Distribution

The geographical concentration of service providers is very marked: 77.2 % are located in Bogotá (34.1%) and 6 Departments: Antioquia (14.8%), Valle (11.6%), Santander (5.5%), Atlántico (4.2%), Bolívar (3.9%) and Cundinamarca (3.2%). The concentration is all the more intensive as most of the institutions are found in the Departmental capitals and not in minor towns and cities.

Problems Related to the Institutional Complexity of the Higher Education System

Overlapping Functions Due to the Structure of Policy-Making and Oversight Institutions

With Decree 1415/2001, which restructured MEN and created DES, there arose an evident overlapping of functions between MEN and ICFES, and this situation has recently become more acute. Table II-5 shows that both DES and ICFES are responsible for development, policy design, advisory services and activities such as sector studies.

Overlapping Functions due to the Decentralization Process

The lack of legislation and institutional development in Departments, metropolitan districts and municipalities (i.e. regional administration) to meet regional needs has meant that the universities tend not to be involved in local problems and regional government shows little interest in the universities. Here, it is evident that central government bodies have for various reasons failed to coordinate with the universities properly, and even less with regional government.

One example of parallel functions is the overlap of authority between the regional CRES (CESU Order 200/93) and Departmental Teacher Training Committees with regard to programs and policies designed to produce professional teachers (Law 115/94). Another example is the duplication between FODESEP (Decree 2905/94 Art. 2.10) and ICFES (Law 30 Art. 38.h) in the area of support and development of local, Departmental and regional integration of the HEIs.

The following reasons explain these problems:

- ☐ The decentralization process in Departments and metropolitan districts only started 4 to 8 years ago, and the emphasis has been on primary and secondary education.

TABLE II-4: INSTITUTIONS IN HIGHER EDUCATION BY DEPARTMENT AND ORIGIN

Departments	Total: Public + Private	Total Public	Total Private	Private Corporate	Private Foundations	Special Regime[80]
Bogotá	106	15	87	39	48	4
Antioquia	46	16	30	15	15	
Valle	36	14	22	13	9	
Santander	17	3	14	9	5	
Atlántico	13	3	10	9	1	
Bolivar	12	4	8	4	4	
Cundinamarca	10	5	3	1	2	2
Norte/Santander	8	4	4	3	1	
Risaralda	7	1	6	4	2	
Boyacá	6	4	2	2		
Caldas	6	3	3	2	1	
Cauca	6	2	4	2	2	
Tolima	6	3	3	2	1	
Nariño	5	1	4	1	3	
Other (***)	27	16	10	8	2	1
Total	311	94	210	114	96	7

(***) Quindío (4), Magdalena (4), Sucre (3), Córdoba (3), Guajira (2), Meta (2), Huila (2), San Andrés (2), Putumayo (2), Caquetá (1), Cesar (1), Chocó (1).

Source: ICFES, Sistema Nacional de la Información de la Educación Superior, Instituciones registradas, 1999, webpage: www.icfes.gov.co

- ☐ The departmental government is a regional authority but is not represented on the CRES.
- ☐ Law 30 reduces the role of Departments in participation and decisions for the creation of a university or the opening of a regional office.
- ☐ There is a single national system of accreditation of higher education institutions, coordinated by CNA. The argument is therefore that "there is no need for a regional model, but it would nonetheless be convenient to include local considerations in criteria for assessing compliance with quality requirements."[81]
- ☐ With regard to funding, there is a split between those who plan spending (the regional universities) and those who provide the funds (central government); and this not surprisingly leads to problems such as recurrent deficits[82] and the consequent problems between regional and central institutions, to the detriment of the educational sector.

Overlapping Functions Due to the Process of Promotion and Evaluation of Quality

Here there is a combination of institutional factors and political considerations. Between 1990 and 2000 a series of bodies were created to evaluate quality (the CNA, CMND, the Consultative Committee, DES/MEN and the ICFES Quality Assurance Division) and they have each directed to attention of government to one of the two aspects of quality—institutions and programs. The other—development—has not been considered as thoroughly. ICFES and FODESEP should unite

80. Professional Education Institutes and Military Intelligence.

81. ICFES. Movilización por la Educación Superior. Mesa Intersectorial, conclusiones comisiones temáticas. May, 2000. Mimeo, pp 11.

82. Fabio Villa y Jesús Duarte. Hacia un esquema de financiación de la universidad colombiana. In "Hacia una Agenda de Transformación de la Educación Superior: planteamientos y recomendaciones." Comisión Nacional para el Desarrollo de la Educación Superior. ICFES. May 1997.

TABLE II-5: COMPARISON OF THE FUNCTIONS OF DES AND ICFES

Function	ICFES (Law 30/1992)	MEN-DES (Decree 1415/01)
Development	Develops quality of higher education	☐ Supports the definition of development and evaluation policies
Policy	Executes government and CESU policies	☐ Advises on policy drafting ☐ Supports evaluation of development programs ☐ Supervises implementation of plans and programs. ☐ In coordination with bodies attached or accountable to it, defines criteria for funding policy and development plans for the sector
Information	Information and documentation center	☐ Proposes sector policy for SNIED* to MEN
Sector studies	Produces basic studies	☐ Supports evaluation of sector studies. ☐ Promotes and produces market studies for higher education, expansion and trends, funding schemes and management.
Cooperation	Stimulates cooperation between institutions	☐ Promotes means of participation and coordination among Higher Education Institutions (HEI). ☐ Drafts and promotes cooperation policy between HEIs.
Register of State Teachers	Administers teachers' register	☐ Prepares State teachers' register (Law 115/94 Art. 148)
University welfare	Administers university welfare fund	☐ Advises and promotes university welfare policy.
Inspection and Supervision		☐ Supports inspection and supervision functions

*National Higher Education Information System

their efforts with COLCIENCIAS and the Ministry of Culture in order to ensure that there is adequate investment in research, facilities and infrastructure.

Lack of Articulation Between the Higher Education System and the Rest of Colombian Education

Central government budget cuts, often made on the grounds that the institutions are inefficient and perform poorly, may in any case produce imbalances: the few institutions which score high marks for quality would survive, but they would not represent the heterogeneous society and cultures of the Colombian people: indeed, they would increase the segmentation and disparities in access to education from which the present system suffers.

Formal education, as regulated by Law 115, is divided into the following levels: (a) preschool, for 3 years; (b) basic, for 9 years, divided into basic-primary (Grades 1–5) and basic-secondary (Grades 6–9); and (c) intermediate (Grades 10–11). Higher education is regulated by Law 30 and scientific and technological activities and research are regulated by the S&T Law 29/99. Higher education is organized into: (a) universities, with undergraduate and graduate programs (the latter including diploma courses, masters degrees, doctorates and post-doctorates); (b) University institutions or Schools of Technology, with programs of instruction in occupations, professions and disciplines, and diploma courses; and (c) technical-professional institutions which provide operational-instrumental instruction and diploma courses.

The education process and the management of education in Colombia is characterized by the fact that finance and administration are now regulated by the decentralization law (Law 60)

whereas the pedagogical aspects are regulated by the Education Law (Law 115). The decentralization of education is also been regulated by separate pieces of legislation, basic-intermediate education being governed by Law 60 and higher education by Law 30. This diversity of legislation has meant that there is no articulation between one level and another; and that Departmental and Municipal administration has no means of intervening in education policy and decisions on teaching methods, especially with regard to higher education. These facts, taken in conjunction with the application of the principle of university autonomy, have made the universities into institutions ever more distant from reality and from the needs of the world around them.

Among the common problems of the education sector are: i) the absence of integrated planning for the sector as a whole, which generally means that there is a gap between the basic content of the early and later years of education; ii) MEN has generally paid more attention to basic and intermediate education, as have the Departments in the course of the decentralization process; iii) higher education budgets, in the scheme of Law 30/92 evidence the split between those who plan spending (regional universities) and those who provide the funds (central government) and this causes constant problems between central and regional administration.

All of the above has been made worse by the challenge facing the higher education system when it has to take in students who have been badly prepared and have no basic skills. The end result is a high number of dropouts and repeaters in higher education, or the production of mediocre graduates. At the same time, it is the higher education system that produces teachers for basic and intermediate education. There is thus a mutual responsibility which requires immediate action to break a vicious circle affecting the quality of the entire education system.

Lack of Integration of Technical/Technological Education within the Higher Education System

Society as a whole undervalues technical and technological education, and central government has neglected to encourage these modes (or "fields of action" as Law 30 calls them) or try to articulate and rationalize the actions of SENA, the Faculties of Education and Science in the universities and MEN. Also, there has been no proper integration of intermediate and higher levels of technical-technological education. There are 900,000 students enrolled in higher education, of whom only 150,000 are attending technical-technological institutions, and only 56,000 of them attending public institutions.

Governance in the Higher Education System

What Governance Means

The word governance, understood as the proper exercise of power, refers to the set of formal and informal devices which allow higher education institutions to take effective decisions and to act on them. First, there is the external exercise of power, that is. the relationship between an institution and the supervisory agencies; then there is internal power, which refers to the lines of authority which govern the external powers. In general, the exercise of power overlaps with performance in many cases where the drafting and execution of policies are involved.[83] There are many external factors which affect governance in any country, and Colombia is not an exception.

External Factors Affecting Governance in Colombia's Higher Education

1. Changes in the Labor Market

Two factors have significantly affected the approach to higher education in terms of the demands of the labor market in recent decades. First, the demand for technology and the speed of technological change; and second, changes in the economic system which means that the individual must constantly be prepared to face the challenge of new forms of work. In both cases the education of the future will require a solid higher education, enriched by new scientific knowledge, which will

83. Special Working Group on Higher Education and Society, Higher Education in Developing Countries: Peril and Promise, Santiago de Chile, 2001, p.64.

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enable professionals and technically qualified people to select, adapt and apply existing technologies properly and to remain active in a constant process of training and instruction.

As part of a balanced regional development policy, firm support should be given to the creation and strengthening of regional universities. The intention is that students should be encouraged to acquire a sense of belonging to their regions and to the university in its teaching and research activities. This means that there must be a clear integration with Departmental and Municipal development plans and with the economy of the region in general.

2. Changes in Demand and in the Profile of Potential Students

Higher education students in the short and medium term, for whom today's university must be improved and tomorrow's university constructed, include the students themselves and schoolchildren in the basic and intermediate systems. The State needs to provide for access and coverage which will match their expectations. In the matter of coverage, Table II-6 shows the small proportion provided for by the State: only 14.3% of those aged 18–24 attend a university.

In terms of expectations that young people have with regard to education, the first one is to have access to a good school. Second, once they are in schools, students have high social and economic aspirations (access to well-paid job). These two conditions—access to good quality education and social mobility—need policies which will support students in economic terms and offer them the possibility of access to a higher education institution of good quality.

3. Fiscal Crisis

The fiscal crisis in Colombia, as in many other countries in the region, has affected both national policies and the universities themselves. The national authorities have encouraged the search for new resources the expansion of student loans in order to guarantee access for students, independently of clear commitments and policies for quality, relevance and equity. There has been a serious drop in the demand for university places, and there is fiercer competition to win potential students. This means that universities need to make greater efforts to find funds, some are even offering loan schemes which compete with those of the banking system and ICETEX, and as a result they are showing much less effort to improve the quality and relevance of their programs. This has obviously increased the risk of a decline in academic standards in the selection of new students.

4. Violence

Governance also involves the exercise of university autonomy and the ability of universities to manage themselves and set their own rules and regulations. It is also a test of whether they can implement participation, efficiency and quality by themselves, so that they will effectively fulfill the function which society requires of them In this case, and especially for historical reasons, the public universities need to be protected against corruption, declining efficiency, lack of commitment, mediocre programs and the violence which is so prevalent. This is a reflection of the intolerance and social disintegration brought about by civil war, leading to frequent shutdowns, interruption of classes and an unfriendly atmosphere which is not appropriate to a learning; and the spread of democratic values. In extreme cases, there are even murders of teaching staff in the classroom in

TABLE II-6: GROSS AND NET ENROLLMENT BY EDUCATIONAL LEVEL, 2000

Level	Gross	Net
Preschool (5–6)	46.8	40.5
Primary (7–11)	111.2	83.6
Secondary/intermediate (12–17)	84.2	62.7
Higher (18–24)	22.2	14.3

Source: Calculations of National Planning Department based on the Household Survey of September 2000.

front of their students. These serious problems reflect a lack of governance in the institution and deficient preparation of students.

What Is Happening to Governance in the Regulatory/Management Institutions?

1. Issues Related to Control, Supervision and Evaluation

It is obvious that there has been a distortion of the concept of university autonomy, for several reasons. One is that the State is powerless to intervene, whether from respect for that autonomy or from the gaps which have opened up with the delays in implementing reforms—in this case Law 30—which would allow them to do their duty by controlling the chaotic expansion of the supply in higher education, and by guaranteeing that the right to a good-quality education will be protected.

Among the greatest obstacles to effective quality control is the lack of a clear and transparent vision with targets and performance indicators for the medium and long term development of higher education. In countries where there is this type of project, it has proved to be the ideal instrument for control and self-regulation of academic performance and administrative and financial activities. In this case it should be noted that, in accordance with the State's duty to evaluate the rationale and cost-benefit impact of public spending and a trend towards greater control over public institutions, some of those institutions have introduced new methods and strategies for planning, evaluation and control, and have defined targets and performance indicators.[84]

2. Issues Related to Information and Accreditation

It is not by chance that Law 30/92 devotes an entire chapter to the treatment of SNA and SNIED. Both systems are conceived as basic instruments in the improvement of quality in higher education. The accreditation system is a vehicle for constant evaluation of institutions and programs, and SNIED is a tool for the circulation of up-to-date and reliable information which will guide the education community in matters of quality, quantity and characteristics of the HEIS and of programs. Both have had certain limitations in their evolution.

SNIED was originally intended to have a wider role than the simple provision of information on accreditation. Now, however, it is being criticized for having limited itself to that function, and for not providing relevant information about the system, which would allow the bodies responsible to manage the sector. Specifically, a system based on performance indicators or management by results could become an extremely useful tool in the rationalization of funds allocations.[85]

Also, with respect to information systems, the Professional and Occupational system proposed by Law 115/93 to be managed by SENA and ICFES, and the National Education Information System called for in the recent Decree 1415/2001 should be articulated into a single, simple, integrated and efficient unit.

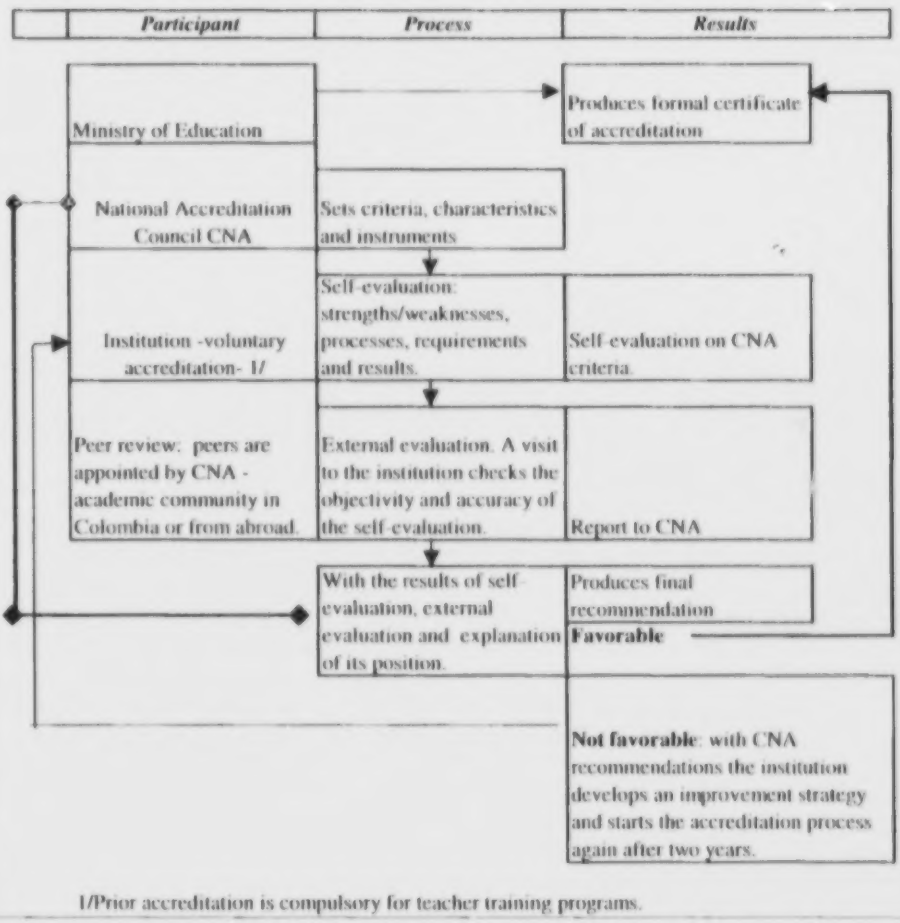
Law 30/92 required institutions to join the SNA as a means of improving the institutions themselves as well as their programs. The process of accreditation was described as voluntary, except for the Faculties of Education, for whom it was made compulsory. (Decree 272/98).

Diagram 3 shows the hurdles faced by higher education institutions in order to receive accreditation in the terms of CESU Order 6/95. Almost six years have now passed, and the accreditation process has barely begun in the institutions. Only 90 programs have been accredited out of a total of some 8,000 in operation. Thus the impact of accreditation on higher education has been very low. It might be said that the small number of programs accredited is a consequence of CNA's low capacity to process applications; but several studies in fact agree that this is a sign that only a few establishments—the "most solid" ones—have entered the process because they believe that their programs have the

84. Greco C., Gobierno y Gestión de la Educación Superior, Una perspectiva de su evolución y desarrollo, p. 182.

85. Pinilla, Pedro Antonio. Indicadores de Gestión y de Resultados de la Educación Superior Oficial. January, 1997.

FIGURE II-3: THE ACCREDITATION PROCESS


Participant
Process
Results
Ministry of Education
Produces formal certificate of accreditation
National Accreditation Council CNA
Sets criteria, characteristics and instruments
Institution -voluntary accreditation- 1/
Self-evaluation: strengths/weaknesses, processes, requirements and results.
Self-evaluation on CNA criteria.
Peer review: peers are appointed by CNA - academic community in Colombia or from abroad.
External evaluation. A visit to the institution checks the objectivity and accuracy of the self-evaluation.
Report to CNA
With the results of self-evaluation, external evaluation and explanation of its position.
Produces final recommendation
Favorable
Not favorable: with CNA recommendations the institution develops an improvement strategy and starts the accreditation process again after two years.

1/Prior accreditation is compulsory for teacher training programs.

characteristics which will guarantee success.[86] Since this level of achievement requires a high level of investment for most HEIs there is a simple choice: increase allocations to investment to improve quality, so that the "less solid" institutions will reach desirable standards of quality, and thus democratize access to a good higher education; or watch the slow but sure disappearance of many public and private institutions, thus running the risk of making the system more elitist.

3. Issues Related to Decision-Making

One problem which needs special mention is that the appointment of representatives to the management boards of the policy-making and oversight institutions of the higher education institu-

86. Niño Diez Jaime, Cobertura, Calidad, Equidad. Segundo Congreso Nacional de Educacion Superior en Colombia. Diciembre, 2001 p 7-8. Orozco, Luis Enrique. Op cit. pp 127-129.

TABLE II-7: DECISION-MAKING LEVELS IN CENTRAL GOVERNMENT

Institution	Responsible for decision making
MEN	Minister is freely appointed and removed by the President
Cesu	– 13 voting members, including the Minister, the Head of National Planning, the Director of Colciencias. The ICFES representative may speak but not vote. – The government regulates the election of representatives of establishments other than itself.
Icfes	The Director is an agent of the President, freely appointed and removed. The Board has 7 members, 6 of them with votes, including the Minister of Finance and a Delegate of the President.
CNA	7 members appointed by CESU for 5 years, cannot be re-appointed
CNMD	5 distinguished academics appointed by CESU for 2 years.
FODESEP	Regulated by the law on the management of economic solidarity institutions (Law 79/88) and the Funds statutes. Has a General Meeting (MEN, ICFES and ICETEX represent the State but are not members), A Management Council and a Manager.
CRES	Formed by the rectors of higher education establishments in the region. (North, Center, South, East and Center-West)

tions themselves does not correspond to any transparent selection process based on clear criteria of competence, even though these Boards make a large number of important decisions at this level of the education system, as indicated by Table II-7 below.

There are common problems in the election of representatives to the boards, which directly affects the orientation and functioning of the system (more in some areas than in others). For example, while CNA is supposed to be a purely academic body engaged in accreditation; CESU has become a political agency dealing with the interests of different sectors which makes decision-making more complex. It is the institution which is most sensitive to individual interests. Therefore the management of an administrative and academic approach, which is predominant in higher education institutions, introduces a constant tension between efficiency and quality, resulting in bureaucracy and permissiveness (mediocrity).

4. Issues Related to the Allocation of Funds

The funding of State university budgets is basically the responsibility of the central government. As already noted this has opened up a gap between the budget and the funds actually made available, and has caused problems in establishing clear lines of accountability. The private universities tend to organize themselves as non-profit corporations or foundations and they too must produce the results expected from their plans and which the system's management and regulatory institutions should demand.

The sources of funds for education are private household income for the private sector; and mostly current revenues of central government for the public sector, with an increasing contribution from student fees in recent years. In 1999 public spending on education was 4.64% of GDP, and private spending represented 4.2% of GDP. This means that the State spent some 4,000 million of Pesos and the private sector a further 3,500 million of Pesos. Spending on public education in that year was distributed as follows: 40.5% for primary and preschool, 31.5% for secondary education, and 19.2% for higher education.[87]

The situation is confused in the specific case of higher education, since budget allocations are not guided by technical criteria but by increases over historic spending levels. Public institutions regularly run a deficit, the reason for this usually being the payment of an extra month's pension

87. Corpoeducación, Sarmiento, Tovar y Alam, Alfredo, Luz y Carmen, Situación d la Educación Basica, Media y Superior en Colombia, Gasto Público en Educación P55. Bogotá November 2001.

(Art. 142, Law 100), the increase in pension and health insurance contributions for part-time lecturers and the hourly rate (Decision of the Constitutional Court, January 1996), the increase in payroll costs in excess of normal salary increases due to the leveling-up of pay scales (Decree 1444/92); and finally, poor administration and management in a large number of cases.

5. Issues Related to Accountability

There are two basic areas of accountability for the proper use of public funds: the first is related to the results of a service which aims to produce competitive, high-quality professionals, sufficiently prepared to be able to assimilate the challenges of technology and the demands of globalization. The second relates to criteria of efficiency and cost/benefit, transparency in the management of funds and indicators defining management standards.

Results can be measured in a number of ways, such as statistics of graduates, professionals placed in the labor market, average incomes by area/profession, publications, research success, innovation, or even the flexibility of the institutions to adapt quickly to changes in the labor market, economic recession, or the need for professionals in different fields of study, amongst others.

With regard to the management of institutions, there have in recent years been several attempts to make information systems technically useful, in the computerization of processes and their results. A culture of utilization of information in areas such as decision-making, project formulation, strategic planning and the identification of results is also growing. This has made the task of control of public funds and accountability easier.

What Is Happening to Governance in the Higher Education Institutions?

1. Issues Related to Strategic Visions

The Higher Education Law recognizes that, as part of their autonomy, universities have the right to ". . . create, organize and develop academic programs, . . . adopt related regimes and establish, allocate and apply funds to meet their social mission and fulfill their functions as institutions. . ." In order to make good use of this privilege, the institution must have a clear definition of its orientation and mission. In this exercise there are two complementary dimensions. The first one consists of the basic type of philosophy, teaching method and scientific, social and political attitude which should guide its work and development. The other one concerns the development, management and operation of the institution with criteria of efficiency, effectiveness, productivity and profitability.

The instrument which brings these two dimensions together is the Institutional Educational Project (PEI). Every educational institution in Colombia is required to produce a PEI as a sort of guiding light for all the academic and administrative work that it does. The PEI brings together aspects such as the nature of the institution, collective effort in setting up the PEI, external demands, specific conditions of strengths, weaknesses and resources, knowledge of external changes etc. It thus becomes the framework within which teachers can work out their own programs.

Most institutions now have a PEI, but it is sometimes not relevant, or that many of those involved in it are not ready to accept or develop it. The most frequent problems occur due to the lack of commitment of teachers to the PEI, or low levels of participation, or resistance to change, or ideological differences. In the area of administration and management, the public universities have sometimes been the victims of political interests or corrupt practices and in such cases there is no interest in upgrading or reorganizing administrative processes. Management is much more efficient in the private sector; but in this sector there are institutions whose administration is run on predominantly business principles.

Regardless of the type of problem, it is up to the policy-making and oversight institutions to supervise and control all institutions within the higher education system. In this area a major barrier has been erected on the basis of a mistaken interpretation of the ill-named "autonomy" of the universities.

2. Issues Related to the Internal Structure, Organization and Processes of the Institutions

Within each institution, and with the way in which "autonomy" is understood, the freedom of instruction, research, learning and subject-matter is affected by the academic performance or political leanings of the teacher or teacher-training institution. In institutional terms there is an effect on the content of academic programs and the admission requirements. In the name of autonomy, even though the State is supposedly responsible for carrying out the functions of inspection and supervision, it has no proper means of guaranteeing the quality of the education offered by the institutions.

Even in the newer institutions, control over program accreditation and over the institutions themselves through the composition of their Governing Councils, has in fact been far less effective than the Law intended. Too many low-quality programs have been allowed to operate, with the justification that they had proper rules and regulations in place and were autonomous to make their own decisions.

Among the most frequent problems are: i) the need for the most important universities to modernize their administration, define structures, allocate responsibilities and have clear lines of authority; ii) in regional institutions the practices and decisions in personnel management, procurement, funds and funds management are hazy, and therefore controls do not really exist; iii) there are no technical means or instruments to follow up plans and projects; iv) the relationships between general management, faculties and departments are of two extreme kinds: in one of them, neither the faculties nor the departments have the autonomy to organize themselves; and in the other, both are allowed to act independently (with overlapping functions) and outside the framework of the policies and objectives of the institution; v) university management is in the hands of employees who lack proper training; and the regulations concerning the administrative staff need an urgent overhaul; vi) in general, all the institutions and the system as a whole need to design performance criteria and indicators.

3. Issues Related to the Budget and Financial Crisis vs. the Planning Process

An analysis of the national budget shows a trend towards a relative decline in importance of the public universities. In the 1980s 23% of the education budget went to higher education, but this had fallen to 13% in the early 1990s,[88] and has probably fallen still further. The situation was reflected in the overall increase of 98.4% in enrollments in private institutions during the 1990s, compared to 52.3% in the public institutions. In the same decade, the share of public education in the system as a whole fell from 40% to 33.5%, the private sector thus gaining 6.6 points.

The arguments advanced to explain this evolution of enrollments mostly involve external factors such as the relative loss of share of the social sectors in GDP, the uncontrolled growth of private institutions, and other factors. The situation has, however, forced the public institutions to analyze themselves and ask questions about their performance since (as we have noted) their regular deficits continue to pile up, affecting the coverage and quality of public education.

The results achieved by the public higher education institutions at the end of each year can help us understand their relative loss of share in the system. The results are poor and reflect problems of clarity of mission and the absence of efficiency indicators in administration, among others. The focus of accountability in the public institutions is basically restricted to a description of budget execution in terms of "source and use," and is simply a bookkeeping justification of expenses. The policy-making and oversight institutions need to work on this area and demand specific results and specific programming in which teaching staff, administrators and management are all committed to work for objectives and to produce good results to fulfill the mission of a public institution.

88. Jiménez José Tomás, La Financiación de la Universidad Pública

Annex III

Quality Assurance in Colombia

Prepared by Robin DePietro-Jurand and Maria-José Lemaitre

The concern with quality has become increasingly urgent as societal changes, such as the expansion of enrollment, institutional diversification, globalization and the reduction of public spending raise doubts about the quality of higher education and prompts the development of quality assurance mechanisms.

While experiencing rapid expansion over the last decade in higher education, Colombia, like many other countries has instituted a quality assurance system to try to ensure that expansion occurs without sacrificing quality. The primary strength of the Colombian QA system—as paradoxically, one of its important weaknesses—lies in its mixed character. It covers everything: institutions, undergraduate and graduate programs, and individuals. It attempts to do everything: ensure starting conditions, compliance with minimum standards, and guarantee high quality. Accreditation has had positive impacts on the Colombian higher education sector by stimulating improvements in the programs and in the institutions that have participated. Still, there are indications that point to some underlying problems: the number of accredited programs is quite small, and there seem to be either many institutions doing similar things or the same institution attempting to carry out many different functions.

What is necessary are improvements that provide some measure of organization to the different QA mechanisms already in place, so that institutions and their programs move along a continuum that promotes increasing levels of quality, and also an increasing sense of institutional commitment with quality. It is recommended that consideration be given to the following modifications in the quality assurance system:

- ☐ Clarify and differentiate the roles of the various agencies involved in Quality Assurance
- ☐ Consider allowing the creation of private accrediting bodies/organizations
- ☐ Establish a new framework for accreditation that relies less on Input-based Criteria
- ☐ Clarify the meaning and expectations associated with 'high quality accreditation' in a context of diverse program offerings
- ☐ Revise the standards being used for high quality accreditation in order to make them more responsive to the needs of technological and technical institutions
- ☐ Include procedures for declaring an institution's eligibility in terms of the student aid scheme

TABLE III-1: GROWTH OF COVERAGE IN TERTIARY EDUCATION
(Selected Latin American countries)

Country	% Of Age Cohort in Tertiary Education		% Increase in Coverage 1980–1997
	1980	1997	
Colombia	**6.5**	***15***	***150***
Argentina	22	36	64
Brazil	11	15	36
Chile	12	32	167
Costa Rica	21	30	43
México	14	16	14
Peru	17	26	53
Uruguay	17	30	77
Venezuela	21	29	38

Source: ICFES for Colombia and UNESCO data (1999) as reported in World Development Indicators 2001.

Introduction and Background

"In areas of Eastern Africa, when two people meet, the first person to greet says: 'I see you,' while the other answers: 'I am here to be seen.' In a nutshell, you have it all: recognition, openness, and trust, the ingredients of any quality assurance system. "I see you," . . . "I am here to be seen." "[89] This is the same process that has been occurring in Colombian higher education over the last decade with the introduction of strengthened quality assurance mechanisms. However, in order to achieve the improvements necessary to bring Colombia's quality assurance system more in line with quality assurance practices internationally, policymakers need to pursue aggressive and sweeping reforms.

Coverage in Colombian higher education remains low in a regional context, however as shown in Table III-1, the system has grown rapidly since 1980.[90] Compared to OECD countries where the average growth rate from 1980 to 1997 actually exceeded that of Colombia, Colombia trails considerably. In the average OECD country over half of the current youth are able to acquire highly advanced skills in tertiary education, which pays off in the labor market by allowing a high and secure living standard. Only one in seven youth in Colombia is able to attend tertiary education, but the quality of the education is uneven and does not always ensure greater labor market payoffs.

Rapid expansion in the sector brought with it growing pains, most notable among them—the perception that there has been a decline in quality and relevance in the higher education system. In response to concerns about the quality of higher education, Law 30 was passed in 1992. Law 30, and its corresponding decrees, seeks to improve the quality of the higher education sector through introducing a variety of quality assurance mechanisms. Since the introduction of quality assurance mechanisms, the Government of Colombia has continued to work to strengthen these mechanisms as a means to improving the quality of the country's higher education. This is particularly important in developing countries because the World Bank's most recent higher education strategy paper (2001) found that knowledge accumulation has become one of the major factors in economic development. Tertiary institutions can offer education, training, and research programs that support knowledge

89. Barblan, Andris. 2001. "International Quality Assurance." Plenary Luncheon Keynote Speech given by Dr. Andris Barblan, Secretary General, Association of European Universities, GENEVA, CHEA 2001 Annual Conference • New Orleans, LA, Tuesday, January 23, 2001.

90. Tertiary education has undergone dramatic expansion between 1990 and the present, expanding at a rate of 20 percent a year, equivalent to the creation of approximately 130,000 new places each year. However, coverage remains at a mere 15% well below the regional average of XX% (DATA).

BOX III-1: CORE ELEMENTS OF QUALITY ASSURANCE

- Semi-autonomous agencies
- Explicit standards and expectations
- Self-study by the academic institution or unit
- External review by visiting experts
- Written recommendations
- Public reporting
- Attention to both process (i.e., capacity) and results

Source: El-Khawas, DePietro-Jurand, and Holm-Nielsen, 1998.

driven economic growth strategies, which in turn, aid in poverty reduction. It is also true that knowledge driven economies experience three major changes in their education and training needs: (i) a stronger demand for higher level skills in the workforce; (ii) the growing importance of "lifelong learning"; and (iii) the rising demand for internationally recognized credentials and qualifications.

Quality Assurance Mechanisms

The issue of quality in higher education is not a new concept. Countries have been grappling with this issue since the introduction of the university and will continue to define and refine the concept of quality as higher education becomes universalized, commercialized, and internationalized (Eaton, 2001).[91]

The concern with quality, nevertheless, has become more urgent as societal changes impact on higher education systems: the expansion of enrollment, institutional and programmatic diversification, globalization and cross-border movement of students and professionals, the reduction of public spending and the need to find new funding sources, are all factors that raise doubts about the quality of higher education and underlie the need for quality assurance mechanisms. (El Khawas, 1998; Thune, 1998; Middlehurst and Woodhouse, 1995; Sanyal, 1995).

Most countries have developed, or are working on the development of, quality assurance schemes. As noted by El-Khawas, et al. (1998) there are several common core elements that have been informally agreed upon as necessary elements of quality assurance systems. These are listed in Box III-1.

However, that being said, it can be noted that different countries have developed different approaches to ensuring quality, in order to address their main concerns. Thus, in some systems, the government plays a pivotal role, while in others, independent agencies evaluate the quality of higher education institutions and/or programs. There are different arrangements also in the relationship between assessment and allocation of resources, be that as the result of funding mechanisms, the provision of incentives, or access to special improvement funds. For example, the governments in the United Kingdom and Australia play a large role in quality assurance. In both countries, teaching and research are subject to assessments based on self-assessment and peer review. In the case of Australia, funding is tied to the results of institutional reviews. Argentina, through the National Commission for University Evaluation and Accreditation has introduced quality assurance mechanisms that rely on transparent and objective information collected from students, managers, and teachers and an allocation mechanism that provides incentives for efficiency (World Bank, 1995).

Systems also differ because some of them emphasize accountability, or compliance with basic quality requirements, while others accredit institutions, and still others place a much higher priority

91. "Universalization" refers to mass higher education and the expectation that everyone will go onto some form of tertiary education; "commercialization" refers to the tendency to define "quality" as market responsiveness co-existing along side of traditional values of education as a public good; and "internationalization" refers to the expanding boundaries of institutions and programs through the creation of virtual institutions and distance and on-line offerings.

BOX III-2: THE UNITED KINGDOM QUALITY ASSURANCE AGENCY: HOW THE ACADEMIC REVIEW WORKS[93]

Established in 1997 to provide an integrated quality assurance system for UK higher education, the Quality Assurance Agency is an independent body funded by subscriptions from universities and colleges of higher education, and through contracts with the main higher education funding bodies. The Agency's main function is to review the quality and standards of UK higher education by auditing the way in which each university and college manages the overall quality and standards of its provision; and by reviewing academic standards and the quality of teaching and learning in each subject area. Reports are available to the public, on their web site and as printed publications. Academic review operates over a six-year cycle, with each institution and all subjects being reviewed once in each cycle.

Reviewing and reporting: The academic review process addresses three interdependent areas:

Reporting on academic standards is concerned with the appropriateness of the intended learning outcomes, in relation to relevant subject benchmark statements; the effectiveness of curriculum design and assessment arrangements in relation to the intended learning outcomes; and the actual achievement of students;

Reporting on the quality of learning opportunities in a subject is concerned with the effectiveness of teaching, learning resources and academic support in promoting student learning and achievement;

Reporting on institutional management of standards and quality is concerned with the robustness and security of processes and procedures relating to the institution's responsibility as a body able to grant degrees and other awards that have a national and international standing. This involves approval and review of programs, the management of academic credit and qualification arrangements, and the management of assessment procedures.

Self-evaluation: The first two areas above are addressed by reviews at the subject level, the last by reviews at the level of the whole institution. In each case, the institution produces a self-evaluation document. This allows it to reflect on what it does and why, and the methods it uses to fulfill its aims. A team of reviewers analyzes the self-evaluation, and then visits the institution to gather the evidence they need to make their judgments.

Source: The Quality Assurance Agency for Higher Education. http://www.qaa.org.uk/

on improvement, in a self-regulating mode. The first are normally put in place when higher education systems have grown rapidly, increasing not only their enrollment, but also the number and diversity of institutions and programs. Accreditation is possible once there is recognition that a basic level of quality has been achieved, and that what is needed is to reinforce and provide incentives for continued improvement. Self-regulation and improvement are effective mainly in systems where institutions are highly autonomous, have strongly developed internal quality assurance mechanisms and there seem to be no need for a public recognition of quality.[92]

Finally, some systems focus on institutional accreditation, others emphasize the evaluation of programs, and still others assess results through different kinds of examinations applied to students and graduates. In some cases, a combination of these strategies is used, taking care to ensure consistent application of standards and procedures.

In the case of Colombia, it is likely that a mixed system, combining both accountability and accreditation, and different levels of focalization, is needed, but different foci and approaches should be clearly differentiated in order for the systems to be effective.

92. Examples of the first type are the evaluation of new, private universities in Chile, the evaluation of undergraduate programs in Brazil or the system to be implemented in Spain; accreditation is carried out by CONEAU in Argentina, in some provinces in Canada, in France and is being established as a new system in the Netherlands. A focus on improvement and self regulation is very strong in the Swedish audit scheme, and has been in the Netherlands, through the evaluations carried out by VSNU.

93. Some of this is being changed, as institutions objected to the way the QAA was operating, and its CEO, John Randall, was forced to resign in Sept. 2001.

TABLE III-2: TERTIARY EDUCATION INSTITUTIONS IN COLOMBIA, BY LEGAL STATUS, 1999

Legal Status of Institution	Number of institutions	Enrollment	% of total enrollment	Graduates (1999)
Universities	95	660,083	79	71,990
University Institutions	70	58,488	7	17,876
Technological Institutions	62	75,199	9	10,046
Technical training institutions	53	41,777	5	6,843
Total	**280**	**835,547**	**100**	**106,755**

Source: ICFES Higher Education Statistics 1999

Overview of the Colombian Quality Assurance System for Higher Education

As in many other countries, Colombia has moved from an elite higher education system to a mass higher education system, marked by broader access and a greater diversity of institutions (universities, university institutions, technical, and technological institutions), study programs, and students. Most enrollment in higher education is found in universities and university institutions (see Table III-2) with relatively low enrollment in the poorer quality technological and technical institutions. This massification of higher education brought with it concerns that the rapid expansion had caused a decline in quality and low relevance, prompting the Government to initiate a quality assurance mechanism.[94]

There are a number of government agencies involved in the quality assurance system for higher education in Colombia. The Ministerio de Educación Nacional (MEN) and the Dirección de Educación Superior (DES) regulate higher education in Colombia. The MEN and the DES formulate policies, plans, programs, and objectives for the sub-sector. The Ministry of Education, in conjunction with the Ministry of Finance and Public Credit and the Department of National Planning (DNP), determines the size and allocation mechanism of public funding to the higher education sector.[95] In addition, the following agencies also have a role in the quality assurance system in Colombia:

Instituto Colombiano para el Fomento de la Educación Superior (ICFES): under the auspices of MEN, ICFES manages three regulatory related tasks with the express purpose of enhancing quality: ICFES (i) supervises higher education institutions and assures that they operate in compliance with the objectives set out in the regulations; (ii) collects, analyzes, and disseminates information concerning higher education via the National Higher Education Information System[96]; and (iii) supports the Ministry and the Consultative Commission in the accreditation and approval process of teaching institutions through Acreditacion Previa (see the section on The Colombian Quality Assurance System for information on Acreditacion Previa).

ICFES also designed and is responsible for administering a national exam, the "ICFES Exam," widely used by institutions in the selection of students to higher education. Initially when developed in 1968, the exam, which was voluntary, allowed any Colombian high school graduate who wished to be admitted to a Colombian university to take the admission test in any city. In 1980 the exam was revised and made mandatory for admission to higher education (Law 81 of 1980)

94. The decline in quality is due, in part, to the speed with which many tertiary institutions are seeking legal status as either universities or university institutions; many are gaining that legal status in haste without benefit of the necessary infrastructure, facilities, or faculty, and without developing high quality programs.

95. The Ministry of Finance and the Ministry of Education have some legal restriction on their allocation powers because Article 86 of Law 30, enacted in 1992, requires that the allocation of funding to state universities from the national and territorial budgets be above that of 1993 in constant pesos.

96. Pursuant to *Decreto* 2662 of 1999, the first two roles have been expanded from focusing exclusively on higher education to focusing on secondary education as well.

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(http://hydra.icfes.gov.co/ingles/evaluacion/StateExams/Default.htm). The "ICFES exam" serves a dual role. First, as noted, it is used as an admissions tool by higher education institutions in judging the quality of its applicants (although, some universities continue to require their own admission test as well); second, it serves as an exit exam from secondary school and as an evaluative tool of the quality of those schools. As such, it provides the MEN with information about the effectiveness of secondary schooling in the country and informs policy formulation and decision making aimed at interventions to improve teaching and learning at the secondary level.

Beginning with the 2001 academic year, ICFES also initiated a national graduation exam for students completing higher education. The Exámenes de Calidad de la Educación Superior, or ECES, was given to students in health and mechanical engineering study programs. The tests were carried out on a voluntary basis, for both the institutions and the students, but it is envisioned that within the next few years, testing will be made mandatory. Furthermore, ICFES plans to extend the coverage of the ECES to include other fields. This approach has proven very instrumental for quality assurance in other countries. For example, in Brazil, the Provão, or the National Evaluation of Undergraduate Programs, is a successful institutional evaluation instrument introduced in 1996.

ICFES also manages the National Higher Education Information System (NHEIS). The purpose of the NHEIS is to collect information on higher education institutions, such as programs offered, number of teachers, courses in a program, etc. However, its main function seems to be in the registration of programs. Before a program can operate in an institution, it must register with the NHEIS and meet some basic minimum requirements. There were problems in the past with the registration of programs. For example, programs would be registered but not offered, or they operated without meeting the minimum requirements. Now, ICFES verifies that the information provided by the institution is accurate before it is registered. Registration is not an actual quality assurance mechanism, but rather an information system providing information on a variety of inputs such as teacher-student ratios, teacher qualifications and type of course offerings. Nevertheless, insofar as it is intended to keep out of the register those programs that do not comply with minimum requirements, it can operate as a basic measure of quality in terms of the provision of the necessary inputs. For this to operate properly, it is essential that ICFES has the ability to check on the accuracy of the information provided at the moment of registration. It is also the responsibility of ICFES to ensure that the information collected for the NHEIS is disseminated to the public so informed decisions pertaining to higher education can be made by students and their families. This information is regularly published in most of the country's major news papers.

- ☐ Consejo Nacional de Educación Superior (CESU): CESU proposes policies and plans to the MEN to develop higher education regulations, procedures, and mechanisms to evaluate the quality of higher education. CESU is under the umbrella of ICFES.
- ☐ Comisión Consultiva de Instituciones de Educación Superior.[97] The recently created Commission, consisting of five members from academia, serves as a consultative body to the Ministry of Education in matters related to the creation of new higher education institutions, the opening by existing institutions of branches, or Seccionales, in other cities, and the transformation of technical and technological institutions into university institutes.
- ☐ Consejo Nacional de Acreditación (CNA).[98] The National Accreditation Counsel, consisting of seven members from academia, is responsible for the design and approval of accreditation mechanisms of higher education programs. It was established with the approval of ICFES and is under the auspices of the Consejo Nacional de Educación Superior (CESU).
- ☐ The CNA determines the conditions of accreditation, currently centered upon self-evaluation and quality, which a program must comply with in order to obtain accreditation. All types of

97. Established in accordance with *Decreto 1176*, June 1999.
98. Established by the passing of *Ley 30* of 1992.

BOX III-3: "PROVÃO," THE BRAZILIAN EXPERIENCE WITH A NATIONAL GRADUATION EXAMINATION

The National Education Law requires the Examen Nacional dos Cursos, or the *Provão*, as a means for continuous evaluation for quality improvement in higher education. The exam is designed to gauge the performance of the institutions more than the performance of the students, but students must take the exam to have their degrees recognized by the government. Data about the institution is self-reported. Institutional results are made public on an annual basis through the internet, newspapers and via a government publication. The publication of *Provão* scores has attracted considerable media attention and there is recent evidence that students and their families are using the information when selecting a tertiary institution. Individual student scores are not publicized, although employers are said to be interested in a potential employee's score.

The *Provão* is currently offered in 24 subject areas but the intention is to have it available in all subject areas in the future. It is the first instance in Brazil of higher education institutions having been subjected to a nation-wide, systematic evaluation. The *Provão* also provides a means for collecting in-depth data on the profile of graduating students, and their evaluation of the quality of the education they received. The graduation test has profoundly influenced the higher education sector in Brazil. The Provão has dramatically raised public awareness about quality in tertiary education. This standard, nation-wide exam measures the performance of graduates in over a dozen disciplines. The results are disaggregated by institution, and published. As such they serve as a *de facto* comparative indicator of the quality of graduates, and, by inference, the quality of instruction and education.

Since its inception in 1996, the Provão has grown both in coverage and influence. The first exam covered only three disciplines (Administration, Engineering, and Law). The very existence of the Provão provoked strong opposition from segments of both the students and the professorates, including boycotts and threatened disruptions at exam sites. Such opposition has not continued, especially given the interest of the press, and the general public in the results. In its sixth year, the Provão is now widely accepted, and several hundred articles have documented the effects it is having on the Brazilian university system. The most notable effect has been to provide much greater information on the quality of individual degree programs to potential students, thereby creating more savvy educational consumers. Private institutions, many of which felt wrongly deprived of prestige by the wealthier, research-oriented public universities, now have an objective means of demonstrating the quality of their programs. Several well known public universities have degree programs whose Provão scores were disappointing; these are now struggling to save their reputations as the leaders in the field.

Students are voting with their feet thanks to the Provão. Applicants now routinely inquire about Provão performance, and schools that do well highlight this information in their informational literature. Those private institutions whose scores have been consistently high have almost universally reported increasing applications. Also, private universities, which have now proven their quality, are attracting talented professors away from public institutions. In addition, the Provão provides a reliable annual survey of graduates, from which important information is gathered on students' backgrounds, attitudes toward their education, and further goals. This information, along with additional evaluation activities undertaken by MEC/SESU [The Ministry of Education/*Secretaria de Ensino Superior*], is creating feedback loops into higher education policy. The Provão is not a cure all for quality in the Brazilian system. It has been pointed out that the system tends to favor the winners, rather than help those that are struggling. In addition, the Provão tends to reinforce the disciplinary structure of Brazil's higher education system, at a time when multi-disciplinary studies and general skills are increasingly valuable. Lastly, the Provão does not at present show the "value added" of the education, since there is not yet a standard exam for high school leavers. Still, even considering these critiques, observers are nearly unanimously agreed on the revolutionary impact the Provão has brought about in concern for quality in higher education.

Source: World Bank. 2000. Brazil: Higher Education Sector Study, vol. I.

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tertiary institutions—universities, university institutes, technical training institutions and technological institutions—may apply for "Accreditation of Excellence." As of February 2002, 110 programs (56 programs in 9 public institutions and 54 programs 16 private institutions) were accredited and an additional 303 programs in 74 institutions have begun the accreditation process. Assuming all of these programs receive accreditation, that would mean a total of 413 programs, or just over eight percent of programs, will be accredited.

- Comisión Nacional de Doctorados y Materias (CNDM). The Commission, created in 1994 by Decreto 2791, is under the umbrella of ICFES and composed of five academics, appointed by CESU, and an observer from ICFES. CNDM members evaluate and approve applications from institutions seeking to establish or continue to operate a Master or Ph.D. program. The CNDM also has responsibility of establishing and maintaining links with foreign universities to stimulate international exchange and promote international contacts.

Colombian Quality Assurance Mechanisms

There are a number of mechanisms that comprise the regulation system in Colombia, several of which can also be included in a global definition of quality assurance. Some of them apply to institutions, some to programs (both undergraduate and graduate) and some to individuals. In Table III-3 it can be seen an approximation to these, organized in terms of the unit of assessment, plus the moment in which they are evaluated (prior to opening or during their operation).

As can be seen, there are a number of different mechanisms, all trying to ensure quality in some aspect of Colombian higher education. Not all of them can be considered strictly to be quality assurance mechanisms by international standards, but since all of them have a role to play, they shall be analyzed in the following section. The main body appears to be ICFES, which carries out most of the regulatory actions but is not publicly acknowledged as a QA agency—a task attributed to CNA and CNDM, both of which have a limited and narrowly defined role within the system.

1. Institutions

Looking at QA mechanisms by level of analysis, the following picture emerges:

Opening. New higher education institutions, as well as new branches of existing institutions and the transformation of technical and technological institutions into university institutes, must be

TABLE III-3: COLOMBIAN QA MECHANISMS BY UNIT OF ANALYSIS AND STAGE OF DEVELOPMENT

	Institutions	Programs (undergraduate)	Programs (graduate)	Students
Opening—Initial assessment	Advice provided to the MEN by Comisión Consultiva de IES	Registration (by ICFES)	Evaluation for opening programs (by CNDM)	Examen ICFES (admission) (by ICFES)
Supervision	Inspección total (by ICFES)	Minimum standards/ Acreditación Previa (CNA and ICFES)	Follow up of existing programs (by CNDM)	(Exams and evaluations within HE institutions)
Accreditation	Evaluation of prior conditions (by CNA, before accreditation)	High Quality Accreditation (by CNA)		ECES (outcomes) (by ICFES)
Information	Information (by ICFES—NHEIS)	Information (by ICFES—NHEIS)	International exchange (by CNDM)	

approved by the Ministry of Education, following the recommendation of the Comisión Consultiva de Instituciones de Educación Superior. The Commission is an advisory body on specific matters to the Ministry of Education. In the case of a new institution, the following requisites guide the Committees recommendation to the Ministry: *(i) new institutions should have the resources to* be able to operate for approximately 1.5 to 2.5 years without using the income from tuition for operating expenses; (ii) they must have adequate physical facilities, laboratories, libraries, etc; and (iii) teaching and administrative staff must fit with the institutional mission (academic and otherwise). In the case of existing institutions, financial resources and their use are examined and, in addition, the record of the institution is carefully reviewed. At this point, in addition to inputs, the Commission also looks at the result of the accreditation process of the institutions programs.

Ongoing supervision. Inspección total (or total inspection) was introduced very recently by ICFES to the higher education system. It requires that teams of government inspectors visit institutions to ensure that they are complying with basic safety and educational criteria. Institutions that fail to meet the requirements are provided with a list of mandatory improvements that must be made for the institution to remain operational. So far, 77 institutions have been visited and it is expected that the remaining 188 institutions will be visited prior to the installment of the new President of Colombia in August 2002.

Accreditation. Before submitting a program to accreditation with CNA, institutions must show that they meet basic eligibility requirements. In order to do so, supporting documents for twelve requirements (see Annex 1a) need to be submitted to the CNA after which representatives from the CNA visit the institution to verify that the twelve requirements are indeed fulfilled. If they are, then a program may proceed with the self-evaluation process.

Information. ICFES, through the National Higher Education Information System (NHEIS), gathers and makes available to the government and to different stakeholders all relevant data about higher education institutions (such as programs offered, number of teachers, courses in a program, etc.).

2. Programs (Undergraduate)

Opening. Registration of programs began in 1990. To offer a program, an institution must register that program with ICFES and show that it meets some basic standards for operation. Requirements are minimal but include information about the number of teachers, their qualifications, available space, etc. Once registered, the program receives a registration number and is included in the NHEIS database. If an institution has already registered a program, but wants to offer it in a different mode or different location, it must be registered again, providing the necessary information pertaining to the new offering. Program registration is required and non-compliance with registration procedures can lead to serious consequences.[99] In 1990, 1,809 higher education programs had been registered; by 1997, this number had grown to 2,948 programs. However, as the Colombian higher education

99. For example, the *Universidad Antonio Nariño* was closed recently for one year for, among other things, failure to register some of its programs. While the university had registered all of its programs offered at its Bogotá location, it had failed to register programs operating at satellite locations around the country. In other words, it was using the registration numbers for its Bogotá programs in its other locations without informing ICFES that those programs were being taught at different locations, with different faculty, etc. The programs, while not technically new, were still required to register to ensure that minimum standards at these satellite locations were adequate. Upon its closure, other universities were asked by the government to accept Universidad Antonio Nariño students into their programs on a voluntary basis. Many students chose to attend other universities while some chose to remain out for the year. Tuition and fees for Antonio Nariño students remained unchanged. When the university reopens, students will be free to return to Antonio Nariño or remain at their new institution, if they are performing satisfactorily.

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system underwent rapid expansion, many programs began to apply for registration, placing a heavy burden on ICFES and resulting in the registration of programs that did not meet the basic minimum requirements and to the operation of unregistered programs. This led to a retooling of the registration process to make it simpler and more transparent. Still, the actual issue is the need to maintain the capability to check on the accuracy of the information provided for registration, without lowering the demands placed on institutions and programs.

Supervision. Programs in Health and Mechanical Engineering must meet recently established Estándares Mínimos de Calidad (Minimum Standards of Quality). These require that programs meet approximately 16 basic requirements. While Minimum Standards of Quality is similar to registration (insofar that they will eventually be applied to programs before they are operating) at present they are being applied to existing programs. Besides, more care is being taken to ensure that institutions applying for this certification actually meet the basic requirements. Meeting the Minimum Standards of Quality is not voluntary. Institutions have two years in which to prove that they have met the minimum standards or they will be closed.

A similar mechanism to Minimum Standards of Quality is *Acreditación Previa*, to which undergraduate and specialization programs in education must submit since 1998. *Acreditación Previa* was made mandatory with the passage of *Decreto 272*, in 1998, in order to ensure a supply of well trained teachers to lower levels of education. Currently, between *licenciaturas* and specializations, Acreditación Previa has been granted to 735, or approximately one-half, of all education programs. Results are made public through posting on the National Higher Education Information System. To receive *Acreditación Previa*, programs are evaluated on 26 input criteria. *Acreditación Previa* is granted for seven years after which a program must show that it has received "Accreditation of Excellence" or it must go through the *Acreditación Previa* process again. The Ministry of Education may shut down any program not granted the *Acreditación Previa* if after a two year grace period, a program fails to meet the requirements. The *Consejo Nacional de Acreditación* carries out *Acreditación Previa*.

There seems to be some struggle over who should be responsible for evaluating the minimum standards of programs. The CNA is responsible for enforcing *Acreditación Previa* for education programs and carried out the evaluation of minimum standards for health and engineering programs. However, law programs will soon be added to the list of programs required to meet minimum standards and it was decided, much to the surprise on the CNA, that ICFES would carry out the evaluations. The argument ICFES is using to justify this move hinges on the nature of the criteria used for evaluation. The requirements are viewed as not being strictly quality criteria, but are classified as "control" mechanisms, and it is for this reason that enforcing Minimum Standards of Quality could be shifted from the CNA to ICFES.

Accreditation. With the approval of ICFES, and under the auspices of the *Consejo Nacional de Educación Superior* (CESU), the *Consejo Nacional de Acreditación* (CNA) was established.[100] The CNA has the sole responsibility of carrying out "Accreditation of Excellence" (as mandated in Law 30, 1992), the primary component of the quality assurance system in higher education. The process of accreditation in Colombia is similar to that in many other countries—self-evaluation by the institution, based on standards adopted by the accrediting agency, a site visit by a group of peer reviewers, and recommendations to, and decision-making by, the accrediting agency. According to the regulations governing accreditation, the legal representative of a higher education institution seeking voluntary accreditation of its academic programs needs to submit a written application to the *Consejo Nacional de Acreditación* ("National Accreditation Council") expressing the desire to accredit one or more programs. CNA assesses the eligibility of the institution through the process

100. While the idea of accreditation was born with Law 30 in 1992, the CNA was established just five years ago. A similar, but separate system for accreditation of Master and PhD programs lies with *Comisión Nacional de Doctorados y Materias*.

of 'evaluation of prior conditions' already described in the section on QA mechanisms applied to institutions. Accreditation is voluntary and is available to all types of higher education institutions. Currently, of approximately 3,400 programs and 4,000 specializations, 110 have received accreditation and another 75 are in the process of receiving accreditation. Of those in the pipeline to receive accreditation, seven are Technological Institutions, four are Technical Training Institutes, and the remaining are universities and university institutes.

For accreditation to work properly and achieve its objectives, it must be a cooperative enterprise among institutions and accreditors. Cooperation is not likely without good coordination and communication.[101] Apparently, the institutions trust the CNA because it is a body comprised of academicians, not politicians. There are seven academicians who serve for five years each on a rotating basis. The rotation of CNA Board members is healthy for the functioning of the organization because this practice endows the Board, and the organization, with an institutional memory that does not exist in other entities due to their political affiliations.[102] Board members meet two to three times a month to carry out the business of the CNA. Another practice that adds to their credibility with the institutions is that peers who volunteer their time to the accreditation process carry out the accreditation review. According to recent CNA data, there are 2000 national peer reviewers and 500 international peer reviewers participating in the accreditation process. Obviously, not all of the reviewers are available all of the time. Accreditation is granted for a period of time, typically between two to five years. After the initial accreditation period, programs wishing to retain their accreditation need to reapply to the CNA for accreditation to maintain accredited status.[103]

Information. As is the case with institutions, ICFES through NHEIS provides information on registered programs to all relevant stakeholders.

3. Programs (Graduate)

Opening. The Comisión Nacional de Doctorados y Maestrías or CNDM (operating under ICFES) recommends authorization of all new doctoral or master's programs to the MEN, guaranteeing that they comply with previously established quality criteria, such as the number of faculty with graduate degrees, the number if international and national scientific publications, resources available to the graduate programs, and the amount of grant money awarded to faculty. The criteria are standard for all fields and programs.

Supervision and accreditation. The CNDM is also responsible for monitoring the development and operation of graduate programs. Accreditation for Master's programs is for five years while for Doctoral programs, it is eight years. After the initial accreditation period is over, programs must apply for reaccreditation. Currently there are 43 Doctoral programs and approximately 250 master's programs that have been recommended by the CDDM and authorized by the Government.

Information. Information to stakeholders is also within the responsibilities of ICFES, but CNDM is in charge of establishing links with foreign universities and promoting international contacts.

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101. Glidden, Robert. 1996. Accreditation at a Crossroads, *Much is at stake as the newly formed Council for Higher Education Accreditation begins its work*. From *Educational Record*, fall 1996. Published by American Council on Education (Special Annual Meeting Issue).

102. Board members serve five year terms. Of the first seven members appointed, three were rotated out after two-and one-half years and replaced with new members. Of the four remaining original members, two were rotated out at the end of their term, leaving two original members who will serve an additional 2.5 years. In this way, there is always someone on the Board who knows what is going on within the organization.

103. Readers interested in the specific accreditation criteria used are referred to the 1998 CNA publication "Lineamientos para la Acreditacion."

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4. Individuals

Admission. ICFES has developed a State Exam (See annex 2) that has been in use since March of the year 2000. It aims to provide a selection mechanism for higher education, to evaluate secondary education, and to give students information on their abilities, in order to orient them in their professional choices. The exam has a common core, which all students must answer, and a flexible component, with different options.

Progression. Through studies is assessed internally by the evaluation schemes in each program. While these schemes are the direct responsibility of institutions, institutional and program evaluations make sure that they are adequate and appropriate to the curricular objectives.

Graduation. Besides normal graduation requirements—also subject to review through accreditation mechanisms—students are invited to take Exámenes de Calidad de la Educación Superior (ECES). These exams are developed by ICFES, and have already been given to students in health and mechanical engineering study programs. At present, they are voluntary (both for students and programs) but it is planned to make them mandatory and to extend them to other fields of study. ECES provide information on learning results, and could be instrumental to improve quality in higher education institutions.

An Analysis of Colombian QA Mechanisms

Issues in the Quality Assurance Process

The accreditation system in Colombia has had positive impacts on the higher education sector. It has stimulated improvements in the programs and in the institutions that have participated. Nevertheless, there is still concern that the quality of education has declined in recent years and has become less relevant in the new knowledge-based, global economy. There is also concern about access, and the need to improve equity without threatening the quality of programs. The government recognizes the role accreditation plays in quality improvement and is continuing to revise and improve its quality assurance system. Still, there are indications that point to some underlying problems:

- In the first place, the number of accredited programs is quite small. One reason for this may be that the standards set for accreditation are too burdensome and that institutions lack the necessary resources to meet accreditation standards. Then, the question is whether other measures and actions should be taken to help institutions to prepare for accreditation, but it would seem imprudent on the part of the CNA to lower quality standards in order to allow more programs to acquire accreditation. Another possible reason may be that accreditation is defined as 'Accreditation for excellence' or 'High Quality accreditation,' meaning that CNA is looking for programs that can be described as models for other similar or equivalent ones. If this were the case, then the obvious result of such an approach would be a small number of accredited programs, as 'excellence' is, by definition, scarce. The question, then, is whether this scheme is effective in terms of assuring adequate levels of quality, albeit not excellent ones.
- Secondly, there seem to be many institutions doing similar things, or the same institution attempting to carry out many different functions. In the first case, both CNA and ICFES are engaged (or will be shortly) in evaluating for Estándares Mínimos in different areas (CNA in education as *acreditación previa* and then as *registro calificado* for health and mechanical engineering, ICFES for law). In the second, ICFES is responsible for program registration, institutional inspection, assessment of minimum standards in the case of law studies, administering the ICFES exam for admission to higher education and the ECES or exams for graduates. It is very difficult for one institution to organize for such different activities, and this may be the reason for some of these activities to be carried out more formally than substantially. This is something that must be looked into carefully, as it seems the logical outcome of

a system that has been growing in response to diverse needs and demands, without having the time or the resources to organize it functionally and organically.

Strength of the Quality Assurance System in Colombia

The primary strength of the Colombian QA system—as, paradoxically, one of its important weaknesses—lies in its mixed character. It covers everything: institutions, undergraduate and graduate programs, individuals. It attempts to do everything: ensure starting conditions, compliance with minimum standards, guarantee high quality. In this sense, it has shown the higher education system that quality is a primary concern for Colombian society, and that quality must be assessed and ensured even before an institution or program begins operation. The weak side of this comprehensiveness is that it is usually very difficult to be able to carry out all these different reviews, which demand different approaches, with the limited resources available to developing countries.

Maybe the most interesting development has been the establishment of CNA and the introduction of its high quality accreditation system. Its strength probably lies in its focus on program accreditation. Systems that focus on accrediting institutions rely on the background and training of the institutions' human resources as an assurance of quality. Many working in the area of higher education reform recognize that an institution's ability to monitor its own teaching and learning processes are key to attaining and maintaining quality. To carry out these monitoring activities presupposes a well-trained faculty that can develop appropriate curricula and determine the elements necessary for quality programs, and qualified institutional administrators or managers. Given the small percentage of Colombian faculty holding Ph.D.'s (2.2% of Professors and 1.7% of *Plazas Docentes*) and Master's (13.8% of Professors and 13.3% of *Plazas Docentes*) many institutions may not have the capacity to assure quality in program development.[104] In any case, to develop adequate institutional capacity for quality assurance requires explicit and definite policy mechanisms, which take much longer and have not been developed until now in Colombia. Therefore, program accreditation focusing on curriculum and other elements necessary for quality, is appropriate.[105] Given the limited magnitude of graduate programs in Colombia, 1999 saw only 16 graduates receive PhD's and 2,113 receive Master's degrees, future staffing needs are unlikely to be filled with faculty members holding this level of postgraduate education. The dearth of graduates with advanced degrees could further reduce the quality of teaching and research and hamper accreditation.

Another strength of program accreditation is that it better meets the needs of developing institutions. It allows institutions to strive for quality by reducing the substantial tasks involved in institutional accreditation, into more manageable "units," thus improving the chances of attaining quality. Institutions can allocate their scarce resources to improving the quality of programs one at a time. Additionally, if accreditation status is publicized, program accreditation also informs the choices made by students and their families when selecting a program at a particular institution. Generally speaking, systems that have had accreditation mechanisms in place for decades are better positioned to use accreditation to build institutional capacity and to sustain quality improvements.[106]

It is important to recognize that even though accreditation is occurring at the program level, many of the areas examined are institutional in nature (see pp. 9–10). Areas of evaluation such as mission, staffing requirements, administration, and facilities reflect on the quality of the institution as a whole, as well as on the program seeking accreditation. Therefore, it is conceivable that the quality of the institution increases with each program that receives accreditation. Eventually, since institutional accreditation is a goal of the Ministry of Education, institutional accreditation could

104. ICFES data; both figures are for 1999.

105. Phelps, Marianne. 2001. "Accreditation and the Quality Assurance System for Higher Education in the Philippines." Philippines Education Sector Development Program, ADB.

106. Eaton, Judith. 2001. "Regional accreditation reform. Who is served?" *Change*, March/April 2001: 39–45.

begin by granting accreditation to those institutions that have a certain percentage, say 75%, of their programs accredited.

Even though program accreditation seems the right way to start developing strong quality assurance measures, the Colombian approach suggests some questions. What is really meant by 'high quality accreditation'? As mentioned before, if it means identifying and highlighting programs that can serve as models to others, it will necessarily have a limited reach—most programs are not, nor can they be expected to be, models for others. While it may be important to have excellent programs to show the way, the question remains about what will be done with programs that are not excellent, but that provide an adequate service. These cannot be accredited as 'high quality,' but should not be denied some kind of recognition. This may be what is expected from the 'minimum standards' evaluation, but in that case, it should be explicitly formulated. On the other hand, it seems peculiar that all institutions and programs are assessed against the same set of standards (factors and characteristics), whether they are universities or technical training institutions, professional or technical programs. It may be argued that the standards are applied by expert evaluators, who understand the nature of the institution or the program, but international experience makes it clear that the assessment of universities is qualitatively different from non university institutions, and that it is not simply a question of degree, but rather of assessing different things.

Improvements to Quality Assurance

What is necessary are improvements that provide some measure of organization to the different QA mechanisms in place, so that institutions and their programs move along a continuum that promotes increasing levels of quality, and also an increasing sense of institutional commitment with quality. In other words, starting with simple and supervisory mechanisms, mostly externally applied, the system should move towards accountability and finally, accreditation based on the institutions' capability to assure the quality of its programs and services.

The QA system must also support the development of the higher education system consistently with the way it is envisioned by the Government.[107] This means, among other things, to support increasing access (which is normally linked to increased quality offerings at the technical and technological level), to ensure compliance with minimum standards for all programs offered in the country, to make programs more pertinent to actual stakeholder needs, to increase links with the productive sector, and to continue to move the tertiary education system towards international standards.

It is recommended that consideration be given to the following modifications in the quality assurance system:

Clarify and differentiate the roles of the various agencies involved in Quality Assurance: With the number of programs seeking accreditation expanding at a rapid pace, the burden on the QA agencies is also increasing. Now would be the appropriate time to examine the role that each entity plays in the quality assurance system in Colombia and how those roles might be better defined to achieve greater efficiency through coordination across, or consolidation of, QA organizations. While in theory, the role of each of the agencies involved in QA is clear, there seems to be some overlap and confusion. When each agency was conceived of and implemented each had a specific purpose. However, fast growth in the higher education sector has caused these agencies to take on more than they are effectively able to handle. Accreditation is costly and time consuming to both the institutions/programs and the Government. As the workload on each agency increases, it is easy to fall into a formal revision or inspection, which gradually erodes the impact on quality these measures were intended to achieve, and actually achieved in their first stages. When this happens, institutions and programs can perceive QA as a game that must be played, with no real influence on what actually happens inside them.

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107. See Orozco Silva, Luis Enrique, ed. 2001. *Educación Superior, Desafío Global y Respuesta Nacional, vol I y II*. Colombia: ICFES

A way to achieve a proper division of labor would be to separate QA efforts by stage and scope of the assessment being made. Thus, the initial stage (authorization of new institutions or new branches of existing institutions and the registration of new programs) could be assigned to one agency, as well as compliance with administrative norms and regulations. Supervision of existing programs, evaluation of quality aspects in institutions, accreditation, compliance with minimum standards (either of institutions or programs) should be the work of a different agency, which takes as its starting point the outcome of the initial evaluation. Exams, either for admission or graduation, could be handled by either agency, but with close coordination as they provide important inputs to the QA efforts being carried out.

Through better coordination of efforts, time and costs associated with accreditation can be minimized without sacrificing quality as was accomplished in Chile (Box III-4).

BOX III-4: CHILE'S PROGRAM FOR QUALITY IMPROVEMENT

The objective of the Higher Education Quality Improvement Program (MECESUP), is to improve the performance of Chile's higher education system. The program has three main areas of focus: development and implementation of a national accreditation system; enhanced links with national development and qualitative improvement in educational services at the technical, undergraduate, and postgraduate level; and improvement in the administration of the higher education system.

Quality Assurance: MECESUP is supporting the development of a quality assurance system with three complementary lines of action. The first is the development of program accreditation mechanisms, as a basis for developing a proposal about a national QA scheme. The second focuses on the development of institutional capabilities for self-regulation, which include the development of self-evaluation and institutional research units. The third refers to the proposal for a national system of QA for higher education services that includes five different but coordinated functions: (i) the consolidation of the national system for institutional licensing of new private institutions. (ii) The establishment of a national information system (addressing the needs for the governance of the HE system, institutional needs and public information for diverse stakeholders). (iii) Institutional evaluation, in order to determine eligibility for public funding. (iv) Program accreditation; and (v) professional certification. The system will be coordinated by an independent agency, but the different functions will be carried out by different agencies. The coordinating agency will be in charge of institutional evaluation and the accreditation of private national or international accreditors for program accreditation. The work is being carried out by two national accreditation commissions, at the undergraduate and postgraduate levels, which have defined program quality standards, implemented a voluntary accreditation system, and are working on the proposal of a definite legal framework. At the undergraduate level, accreditation work has started with almost 100 programs in most professional fields, as well as technical programs. At the graduate level, a second accreditation cycle for 65 Ph.D. programs was completed in 2000, and a new cycle for 100 master's programs is currently under way. The accreditation system is based on self-evaluation, external peer review, and academic audit. Institutional assessment and audits are also part of an institution's being eligible to receive student aid from government.

Educational Quality Improvement: MECESUP has started the operation of a "competitive fund" to promote quality and relevance in the higher education subsector, through the provision of grants to beneficiaries for undergraduate programs in fields of institutional and national priority; for graduate programs, with emphasis on doctoral programs and master's programs in the arts, humanities, social sciences, and education; for technical training programs in fields of high demand from the productive sectors; and for the improvement of the facilities, equipment, and human resources in institutions, as required to implement the programs referred to above.

The competitive fund started operation in 1999 with a first competition, in which 57 projects were selected; 41 in support of undergraduate and 16 of graduate programs. The second round of selection, in 2000, ended with the approval of 70 new proposals. Eligible expenditures for the projects are human resources improvement

(*continued*)

BOX III.4 CHILE'S PROGRAM FOR QUALITY IMPROVEMENT (Continued)

(scholarships for postgraduate work in Chile and abroad, visiting scholars, short visits abroad for professors and Ph.D. students in thesis work, and postdoctoral visitors in Chile), goods (laboratory and scientific equipment, access to information and its technologies, and new teaching-learning tools and processes), and buildings (academic space improvement). In April 2001, another competition occurred which allocated US$52 million to institutions with relevant proposals. The institutions select the projects based on institutional strategic planning and priorities and national guidelines.

Policy Framework and Capacity Building: MECESUP is also working to enhance the legal and regulatory framework for the higher education subsector through defining the appropriate roles of the universities, professional institutes, and technical training centers involved; the establishment of mechanisms to facilitate transfers of students and graduates among such educational institutions; and the preparation of draft laws, regulations, or amendments to existing laws. The program is also assisting in the implementation of policy and in institutional capacity building at higher education institutions and at the Division of Higher Education, in the Ministry of Education. Finally, it has started to establish a coherent policy for public funding and the development of a funding methodology for higher education activities, including student aid.

Source: Reich (2001)

Consideration should be given to allowing the creation of private accrediting bodies/organizations, which are accredited by the CNA or other national agency. In this way, the burden of program, and eventually institutional, accreditation would be spread among several organizations lessening the time taken to accredit programs. This would speed up the accreditation process and allow accrediting agencies to keep up with the demands of the cyclical nature of the accreditation process, which requires reaccreditation every two to five years.

Establish a new framework for accreditation that relies less on Input-based Criteria: The system, as it currently stands, makes judgments on quality based mainly on inputs that are quite detailed and prescriptive. The use of an input-based accreditation model is effective in ascertaining that minimum standards are met and may be useful in recognizing new programs. However, once a program has successfully met these requirements, it is important to go beyond these criteria and examine whether the program is effective at teaching students and that the desired learning outcomes are achieved in other words—there should be a shift toward evaluating program competencies and processes as well as more general outcomes, such as retention rates, employment patterns, adherence to mission, etc. (Phelps, 2001; Eaton, 2001).

Some movement in the direction of using outcomes as a means for evaluating the quality of programs began in 2001 with the introduction of exit examinations in the fields of health and mechanical engineering. It is still too early to gauge the impact that these exams will have on quality assurance of the selected programs, or on the decisions students make in choosing an institution. If the desired effects are achieved via the exams, ICFES may want to invest in developing other exams in other fields. Exit examinations are not the only mechanism available to monitor the quality of a program. Other instruments, such as student grades, student portfolios, retention and graduation rates, and tracking various labor market outcomes for graduates, such as the time it takes to find employment, the type of employment found, and salary, would also contribute to programs/institutions competing with each other to maintain quality standards.

Clarification of the meaning and expectations associated to 'high quality accreditation' in a context of diverse program offerings. The existence of high quality accreditation is an important development, and it should be protected from becoming just a label for regular accreditation available to most programs. In order to do so, it is essential that it is recognized as something that will always be restricted to a limited number of programs—those that are able to show excellence in whatever field they oper-

ate. But this does not mean that the other programs—those that are not excellent, but adequate—should not enjoy the possibility of being thus recognized. To make clear, for example, that 'minimum standards evaluation' is the basic equivalent to which all programs must submit, would remove most of the pressure on the accreditation scheme to increase the number of programs being accredited. But in order to do this, it must be possible to extend the 'minimum standards evaluation' to most professional, technological and technical programs, which may be beyond the possibilities of CNA or any other agency in Colombia at present. This must be taken into account, because the alternative might be to reduce the 'minimum standards evaluation' to a formal revision of documents presented by institutions, without verification. Accrediting accreditors for this kind of evaluation may be a good answer to maintain the level of the 'minimum standards' without overextending the existing agencies.

Revise the standards being used for high quality accreditation in order to make them more responsive to the needs of technological and technical institutions. As mentioned before, most of the international experience regarding the evaluation of non university tertiary institutions shows that these institutions and programs have a different approach to teaching and learning, that must be recognized in the development of the standards and evaluation criteria that are applied to them. For example, practice requirements within the curriculum, the kinds of links that must be established with the productive sector or other labor opportunities, the qualifications of teaching staff, are all conditions and characteristics very different from other similar requirements in university programs and institutions. Even if qualified reviewers apply the standards, the fact that they have been developed for universities makes it look as if they were the 'real' institutions, and all others are second-rate instances, that are evaluated mainly by watering down real standards to make them applicable. The only way to avoid this perception is to develop standards for technical and technological institutions starting from their own rationale and using the language that is appropriate for their programs and offerings.

Quality assurance should include procedures for declaring an institution's eligibility in terms of the student aid scheme. For example, criteria might include i) clear and appropriate procedures outlining the establishment of new teaching programs; ii) adequately functioning in-house quality control process; iii) Public availability of vital performance indicators and information on graduates so students and their families can make informed decisions regarding which higher education institution best fits their needs; evidence of sound financial management and accountability procedures.

In summary, the main recommendations would be to give a hard look at the QA system and to try to organize it in such a way that a sensible division of labor is achieved between the responsible agencies. Once each agency has responsibility over a set of actions, it can work towards making them consistent with each other and with the areas that fall within the reach of other agencies. Thus it will be possible to avoid redundancy and to make sure that all the important areas are covered, even if that means that some of the things currently being done lose their pre-eminence and can be postponed for a while.

Annex IIIA Voluntary Accreditation Application For Academic Programs Offered By Higher Education Institutions

What Does The Procedure Involve

If you are the President and/or Legal Representative of a higher education institution who wants voluntary accreditation of its academic programs, consisting in the testimony given by the State of such programs quality, organization, operation and compliance with its social function, please submit the corresponding written application.

Requisites And Documents Required For The Procedure

A. Requisites For The Institution:

1. Be duly authorized to operate as a higher education institution and to award degrees in the program to be accredited.

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2. Comply with the legal regulations established for higher education, and particularly, the ones corresponding to this type of institutions.
3. Have a clearly drawn up mission, coherent with its nature and institutional definition, to be publicly known. Since the mission must be reflected in the institution's academic activities, its achievements must be capable of being evaluated.
4. Have drawn up an institutional project that serves as a fundamental reference for the decision-making processes.
5. Have an appropriate professional staff for the nature of the institution and the program being accredited, with respect to quantity, quality and dedication.
6. Have professors and students' by laws and regulations, which include clear selection and admission policies. These regulations should define rights and duties for both teachers and students, and the participation system in the institution's directive bodies.
7. Have a tradition in the program to be accredited, reflected in its effective incidence on the area, and existence of several graduate students promotions, with the possibility of following up their professional performance.
8. Have an organizational structure with administration and management systems corresponding to the program's and the institution's nature, size and complexity.
9. Have the facilities and the locative and logistic infrastructure to satisfy the institution's and the program's requirements.
10. Maintain a proven financial stability and adequately use the resources available, in agreement with the institution's nature, mission and objectives.
11. Have the appropriate institutional environment and the policies and facilities designed to maintain all its members welfare.
12. Not having been sanctioned, in the last 5 years, due to failure to comply with the legal regulations governing higher education, nor being intervened at the time the application is made.

B. Documents Required

Communication from the institution's Legal Representative addressed to the Consejo Nacional de Acreditación ("National Accreditation Council"), expressing the desire to accredit one or more academic programs.

Send to the National Accreditation Council the following: information about legal aspects; duly approved internal regulations, information regarding academic aspects; information regarding institutional resources.

Place Where The Citizen Should Attend

Submit documents to:
ICFES—Consejo Nacional de Acreditación.
Av. 19 No. 6-68. Oficina 404. Santa Fe de Bogotá, D.C.
Tel.: 3411050, 3411052, 2862910, 3425719 Fax. 2863416

E-mail:
cna@icfes.gov.co

Main Standards That Regulate The Procedure: (*) Law 30 of 1992; CESU Accord No. 06 of 1995 from CESU.

Annex IIIB State Exam 2000 To Enter Higher Education

Background

The State Exam applied by the ICFES since March of the year 2000, has been the result of a process stared in 1995, during which the theoretical fundamentals of the proposal and the evaluation instruments specifications were developed, and the exams preparation and application were redefined. Such general transformation process was developed within the following context:

- Renewal of the country's fundamental educational objectives generated in the Political Constitution of 1991 and the General Education Law (Law 115/94).
- Recommendations from the Public University Modernization Mission and the Science, Education and Development Mission.
- Changes and innovations in the world context regarding disciplines that conform the exam, as well as the introduction of new psychometric models for educational measurements and evaluations were produced.
- New cultural, social, political, and economic demands emerged in the globalization context.
- Internal work developed by the ICFES during the years the exam has been applied.
- Advances in this type of tests in the international scope.
- Research started at the ICFES since 1991, as a part of the Quality of Education evaluation process, whereby tests were developed known in Colombia as SABER (KNOWLEDGE).

State Exam Objectives

The State Exam objectives are the following:

- Serve as criteria to enter higher education.
- Inform students about their aptitudes in each of the areas evaluated, in order to contribute elements aimed at orienting the student in their professional choice.
- Support self-evaluation processes, and continuous improvement within school institutions.
- Establish itself as the basis and instrument for developing cultural, social, and educational research and studies.
- Serve as criteria to award educational benefits.

WHAT IS EVALUATED? The State Exam evaluates the competence or know-how of students in different contexts. In other words, the action performed by a student within the context of a knowledge discipline (test) or a specific problem. Types of actions performed by a student when answering each test are validated and acquire particular forms in accordance to the context in which they are evaluated. The types of actions are the following:

Interpretative: aimed at finding the sense of a text, a proposition, a problem, a graph, a map, a diagram, arguments in favor or against a theory or proposal, and local or global reconstruction of a text, among others.

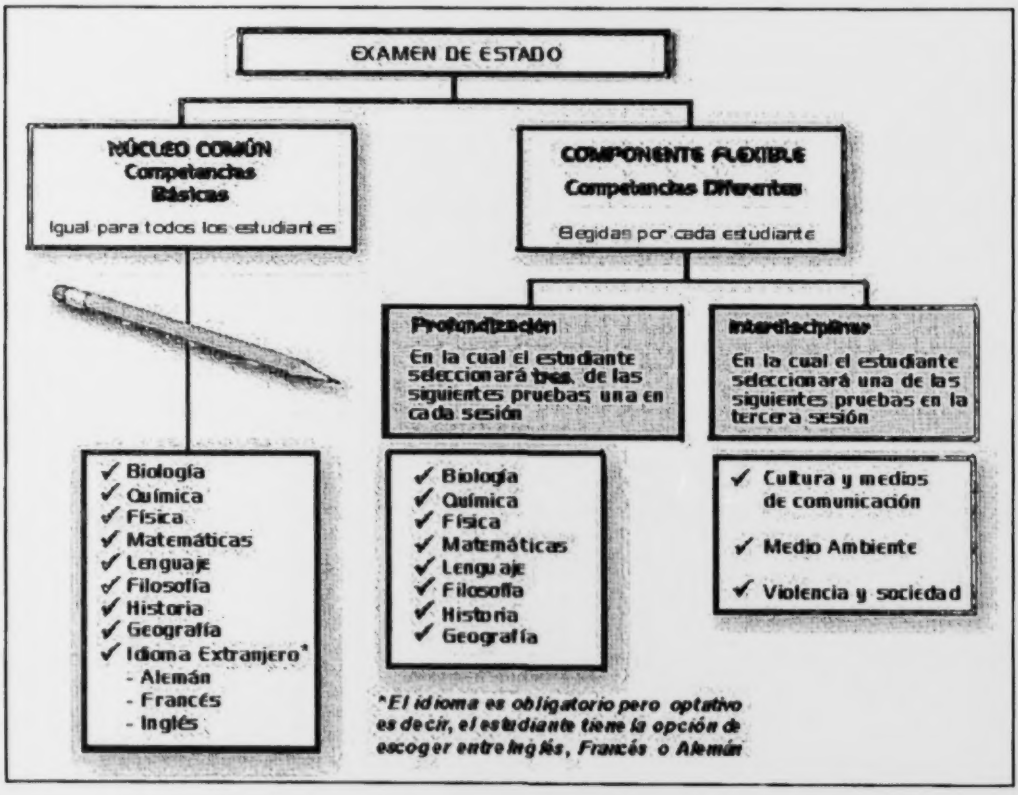
Argumentative: their purpose is to provide a reason for an assertion and are expressed as to the reason of a proposition, the enunciation of concepts and theories, in a mathematic demonstration, in connection with partial reconstructions of a text that supports global reconstruction, in the organization of premises supporting a conclusion and establishing causal relationships, among others.

Propositional: it implies hypothesis generation, determining strategies to solve problems, building possible worlds in the literary scope, establishing regularities and generalizations, proposing solution alternatives to social conflicts, drawing up explanation alternatives for an event or a set of events, or comparing perspectives presented in a text, among others.

Exam Components: The evaluation is carried out through two components:

1. A common core that evaluates basic skills, in basic and medium education fundamental areas
2. A flexible component allowing the student to put into action his/her skills in greater complexity levels (in depth) or before current problems (interdisciplinary)

Exam Structure



Exam Application Sessions

Session	Test	Number of Questions	Available Time
FIRST	Biology	35	1 hour
Saturday	Mathematics	35	1 hour
Morning	Philosophy	35	1 hour
	In Depth	20	45 minutes
SECOND	Physics	35	1 hour
Saturday	History	35	1 hour
Afternoon	Foreign Language	35	1 hour
	In Depth	20	45 minutes
THIRD	Chemistry	35	1 hour
Sunday	Language	35	1 hour
Morning	Geography	35	1 hour
	In Depth	20	45 minutes
	Interdisciplinary	15	45 minutes

In Depth: In depth tests evaluate with greater complexity, levels of the students skills of the common core disciplinary contexts. The student will select three tests, one in each session.

Interdisciplinary: environment, communication media and culture, violence and society.

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Results

Score in the Common Core Tests: is a quantitative score expressed in a scale from 0 to 100 points, approximately, and it can be interpreted in three great ranges: LOW: between 0 and 30 points; MEDIUM: between 31 and 70 points; HIGH: between 71 or more points.

Results by Groups of Questions: it describes students' performance in different topics of the common core tests. These results are interpreted based on the following performance categories: Significantly High (SA); High (A); Medium (M); Low (B); Significantly Low (SB)

Ability Level: it describes the level reached by students in each of the skills evaluated in the tests. Results are presented in three levels: Low A; Medium B; High C

In Depth Degree: the in depth degree achieved by the person in each of the tests selected by him/her is indicated. Four degrees are defined, from a lower to greater complexity: Basic Degree GB; Degree I; Degree II; Degree III.

Interdisciplinary Test Score: it is a quantitative result expressed in the same scale as core tests, in other words, from 0 to 100 points, approximately, and it is interpreted in the same ranges.

Annex IV

Science and Technology: Status and Perspective

Prepared by Natalia Agapitova, Lauritz B. Holm-Nielsen and Goga Vukmirovic

Introduction

Colombian economic performance is promising, but the current recession showed the fragility of the economy and the fact that the country cannot sustain growth without major changes in its development strategy. Taking into account the growing gap of science and technology (S&T) level between Colombia and benchmarking economies, Colombia needs to invest in the fundamentals for a knowledge-based economy.

To successfully address the challenges of the knowledge driven economy, the government needs to provide further incentives to promote S&T in society by creating appropriate institutional structures and focusing on the country's competitive advantages. In order to help the Colombian S&T policy-makers in their quest for optimal development policies, this paper takes a closer look at the actual state of development of science and technology in Colombia.

Understanding the linkages among the actors in innovation is key to improving a country's technological performance, and it is now largely accepted that the effectiveness of public policies on innovation depends on the capacity of policy makers of a comprehension of innovation as system. Therefore, the National Innovation System (NIS) conceptual framework, described in the Box IV-1, is being applied because it is:

- ☐ Methodologically developed
- ☐ Institutionally oriented, and
- ☐ Widely used, especially by OECD studies

A complex set of relationships among actors producing, acquiring, disseminating and applying various kinds of knowledge includes not only explicit connections, but also all forms of tacit links that are based on everyday interactions within a collective system of knowledge. The most difficult task for a researcher or a policy-maker is to discover, systematize and measure the magnitude of links relating the elements of national innovation system. The majority of statistical databases

BOX V-1: NATIONAL INNOVATION SYSTEM (NIS)

National Innovation System is a set of distinct institutions that contribute to the development and diffusion of technologies and provides the framework within which policies are implemented. Many different actors are involved in order to create, store and transfer the knowledge, skills and artifacts, which define technological opportunities of the national economy:

- Institutional framework and economic incentives;
- Economic background and its effect on the knowledge economy;
- Factor conditions (human capital, infrastructure, health and environment . . .);
- R&D.

Innovation systems may vary across countries, for the reason that different institutions reflect different cultures, have different objectives and respond to different incentive mechanisms, but, invariably, the co-ordination of the various institutions is the key issue.

B.-A. Lundvall, [1992], OECD [1997]

supply sufficient indicators to identify and evaluate the explicit links; for instance number of mergers and acquisitions, contractual agreements and other formal contracts. A profound knowledge of a country's social and economic web is mandatory to discern and quantify the tacit links.

Although the existing Colombian statistical information is relatively comprehensive, the available indicators do not reflect the implicit knowledge sharing. However, policy-making, especially in such a complex field as innovation, requires an accomplished understanding of the functioning of every NIS element and interactions among them. Therefore, this study primarily aims to describe the key elements of the Colombian NIS and identify its strengths and weaknesses. Yet, an extensive characterization of the country's national innovation system that could lead to specific policy recommendations requires additional information regarding the variety of links and their possible use for Colombian S&T development.

The chapter is organized as following:

Section 2 introduces the key economic indicators of Colombia, comparing the country to the regional average and benchmarking economies. In the global perspective, the greatest barrier is political instability, aggravated by the recent economic crisis. In the longer term the challenge will be to develop a harmonized national innovation system, serving as a basis for high and sustainable economic growth.

Section 3 summarizes key elements of the institutional framework of the Colombian innovation system, existing economic incentives and government policies. Colombia enjoys a well-developed institutional structure and a long-term experience of government support of S&T. Nevertheless, public investment is limited and favors traditional sectors and powerful regions, which aggravates regional disparities.

Section 4 focuses on the implication of S&T in the Colombian economy, especially innovation capacities of industrial enterprises and the development of knowledge-based industries. The most important issue in this respect is promoting industrial clusters, stimulating innovation and strengthening government programs for technology diffusion.

Section 5 examines factor conditions for S&T development, especially human capital and information infrastructure. Whereas considerable progress has been made in infrastructure development, the low-skilled labor stands out as the most important limitation to an enhanced science and technology diffusion.

Section 6 summarizes the challenges of scientific research and experimental development in Colombia and the coordination of previously discussed elements. Colombian scientific perfor-

mances are inadequate. The recent development of the chemical industry, classified as knowledge based in OECD statistics, has had several positive effects, including the rising number of patent applications and growing integration of the universities into industrial research, which underlines the importance of high-technology industries to the innovation and science development.

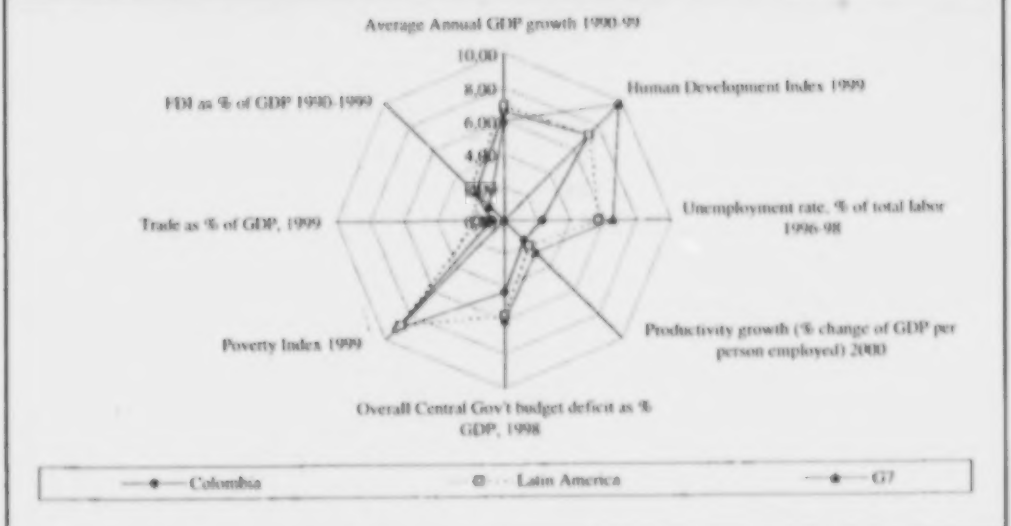
Finally, the concluding section highlights key issues of the Colombian NIS and proposes some policy recommendations.

General Information and Historical Background

With a population of 42.3 million, area of 1.1 million square kilometers, and GDP of US$81.3 billion in 2000, Colombia is a country of noteworthy resources and potential. Still, it is a developing country classified in a group of lower-middle-income economies. Colombia's economy enjoyed relative stability and growth for most of the 20th century, and, despite the slow-down in the 80's, the fall in output experienced by other economies in the region was avoided, and in the second half of the decade, the level of growth was among the highest in Latin America. With average GDP growth around 3% during the last 10 years, deepened integration in international trade, increasing productivity and foreign direct investment (FDI) and in spite of its internal conflicts and recent economic recession, Colombia seems to be one of the most promising developing economies of the region.

The relative institutional stability and liberal reforms ('apertura' program) in early 1990's attracted foreign investors in the most important economic sectors. GDP growth reached an average of almost 5% per year in 1992–95, but such rapid expansion proved unsustainable. High interest rates compensating for the growing fiscal imbalance restricted investment in manufacturing and inflated the exchange rate, reducing competitiveness. As a result, manufacturing output stagnated between 1995 and 1999, and overall growth slowed to an average of less than 2% in 1996–98. The

FIGURE IV-1: GENERAL PERFORMANCE INDICATORS


Average Annual GDP growth 1990-99
10,00
8,00
6,00
Human Development Index 1999
FDI as % of GDP 1990-1999
Trade as % of GDP, 1999
Unemployment rate, % of total labor 1996-98
Poverty Index 1999
Productivity growth (% change of GDP per person employed) 2000
Overall Central Gov't budget deficit as % GDP, 1998
Colombia
Latin America
G7

Note: The data used for scorecards was kindly provided by the World Bank Institute's program on Knowledge for Development (normalized database, with each of the variables normalized on a scale of zero to 10). The regional averages were calculated by the authors. Several data was missing for the least developed of Latin-American countries.

strong exchange rate contributed to a widening current-account deficit, and collapsing investor confidence at the end of 1998 precipitated a recession, with GDP contracting by 4.2% in 1999. Recovery in 2000 was not strong, with growth reaching a modest 2.8%, led by exports encouraged by a more competitive exchange rate.

The penetration of imported manufactures into the Colombian market, followed by trade liberalization, put the local industry under pressure: in order to be competitive in the new environment it was necessary to improve the quality of production and to cut costs by adopting more flexible employment practices and by outsourcing. Although there has been progress in terms of productivity, competitiveness remains heavily dependent on the exchange rate. The last decade uncovered the fragility of Colombian economy and the growing need to its adjustment towards a modern 'knowledge society.'[108] At this prospect, one of the first priorities of the development policies for Colombia is not to miss the knowledge revolution and to assure a proper functioning of its' national innovation system.

Ranged in the group of scientifically developing countries (RAND, 2001), in the regional context Colombia reached the average in term of its technological abilities, but it remains considerably behind the benchmark countries in all areas except entrepreneurship (Figure IV-2).

It appears that Colombia has not taken advantage of its strongest innovation indicator—the entrepreneurial ability of its population. Only 6.6% of small firms and 8.7% of medium firms in Colombia are truly innovative, compared to 15.1% of multinational-dominated[109] big enterprises[110] (OCyT, [2001]).

Private investment remains at a low level, discouraged by low confidence in the political system, security problems arising from violent conflicts, high level of crime, and concerns about the fiscal imbalance. Therefore, local competitiveness and financial institutions' regulation remain poor even at the regional level and notably behind the developed countries. The growing unemployment contributes to further increases in income inequality.

Despite government efforts, the contribution of innovation and technology to the long-term Colombian economic development has been limited, and the country's innovation system manifests serious gaps. The improvement of the overall capabilities of the country calls for a multi-prolonged effort oriented towards all elements of the NIS.

These elements are strongly interdependent (WBI, 2001). It is not enough just to improve one and expect that the others will readjust automatically. Government action coupled with international assistance is necessary to build a comprehensive development strategy, which would spur economic and social growth.

In order to explain the weaknesses of the Colombian innovation system, we should take a closer look at its key elements:

- Institutional framework and economic incentives;
- S&T in the productive sector;
- Factor conditions; and
- Scientific activities.

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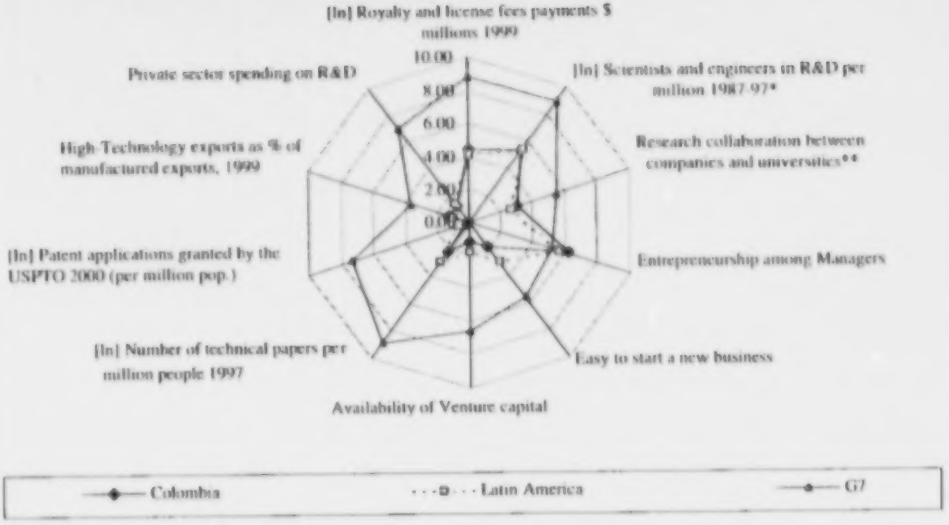
108. The concept of 'knowledge-based economy' and 'knowledge society' in this paper corresponds to the broad definition given in "Brazil and the knowledge economy," C. Dahlman, A. Adhar-Utz, J.-E. Aubert, C. Zhen-Wei Qiang, WBI, 2001.

109. The very fact that the innovation rate is higher among big enterprises is not unusual (for example for the OECD countries), but most of Colombian big innovative firms are foreign-owned, and their innovation abilities are strongly dependent on knowledge imports.

110. It's difficult to compare Colombia to other countries since data sources vary. For example, the OECD divides the firms into two categories: fewer and more than 500 employees, while Colombia statistics classify firms into four categories, the largest category regroups enterprises with more than 200 employees.

FIGURE IV-2: TECHNOLOGICAL AND INNOVATION INDICATORS


[ln] Royalty and license fees payments $ millions 1999
10.00
8.00
6.00
4.00
2.00
0.00
[ln] Scientists and engineers in R&D per million 1987-97*
Research collaboration between companies and universities**
Entrepreneurship among Managers
Easy to start a new business
Availability of Venture capital
[ln] Number of technical papers per million people 1997
[ln] Patent applications granted by the USPTO 2000 (per million pop.)
High-Technology exports as % of manufactured exports, 1999
Private sector spending on R&D
Colombia
Latin America
G7

*In the original WBI database the number of scientists and engineers in R&D was missing. We completed the database by the RICYT statistics, available only for 1996–1998. Two points should be taken into account: the number for Colombia would probably be smaller for 1987–1997, but since for general Latin American indicator only the most developed countries supplied information, both numbers could actually be smaller, but approximately at the same level.

**The appreciation of the level of collaboration between universities and private firms is controversial in different sources. While both EIU study (2001) and the US Department of Commerce study point out that no close links between universities and industry have been developed, the WEF Global Competitiveness Report used in the actual scorecard is much more optimistic.

Institutional Framework and Economic Incentives

Institutional structure remains one of the weakest points of the Colombian society. Despite the relative constitutional and institutional stability (compared to other Latin American countries), drug trafficking and political corruption are the most destabilizing factors, seriously affecting the political stability and rule of law (Figure IV-3).

Political Instability and Corruption

The political exclusion of the poor, marginalized by great social inequality, a highly concentrated pattern of land ownership and an inefficient justice system, created the conditions for the emergence of several violent rebel groups, two of which are still active. Notwithstanding Colombian Government efforts and international support for the current peace process, little progress has been achieved towards peace.

Since the 1980's, the insecurity brought by guerrilla warfare has been further aggravated by drug trafficking. The wealth amassed by the drug cartels through the trading of illegal drugs has fed violence and corruption, distorting the country's political and social foundations. Through bribery, blackmail and violence, the cartels even succeeded in incorporating a ban on extradition into the 1991 constitution.

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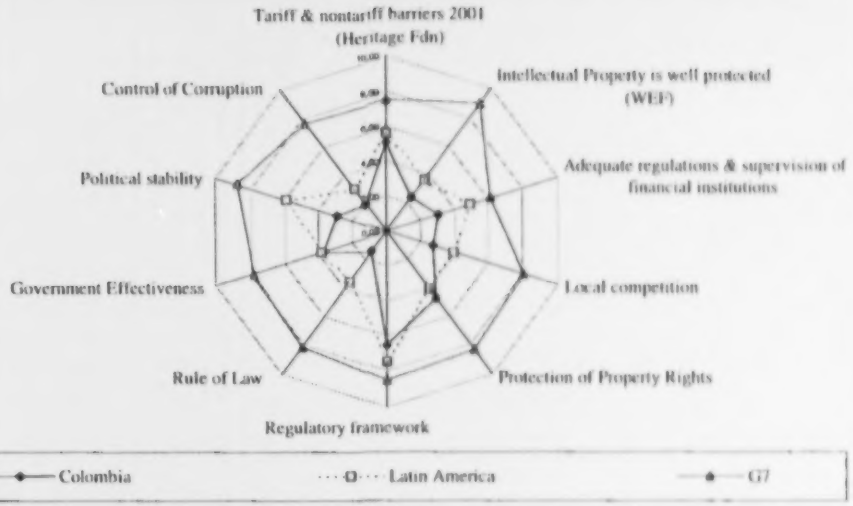
FIGURE IV-3: INSTITUTIONAL REGIME AND ECONOMIC INCENTIVES



Institutional Framework Supporting NIS

Colombia is among the few Latin American countries that have enjoyed almost uninterrupted constitutional and institutional stability throughout its history. As a result, the institutional structure supporting Colombian innovation system is well developed and includes four levels of interrelated institutions schematically represented in Table IV-1.

The largest funding agency is Colciencias—Instituto Colombiano para el Desarrollo de la Ciencia y la Tecnologia, which, in 1997, accounted for over 27% of all government expenditure in S&T.

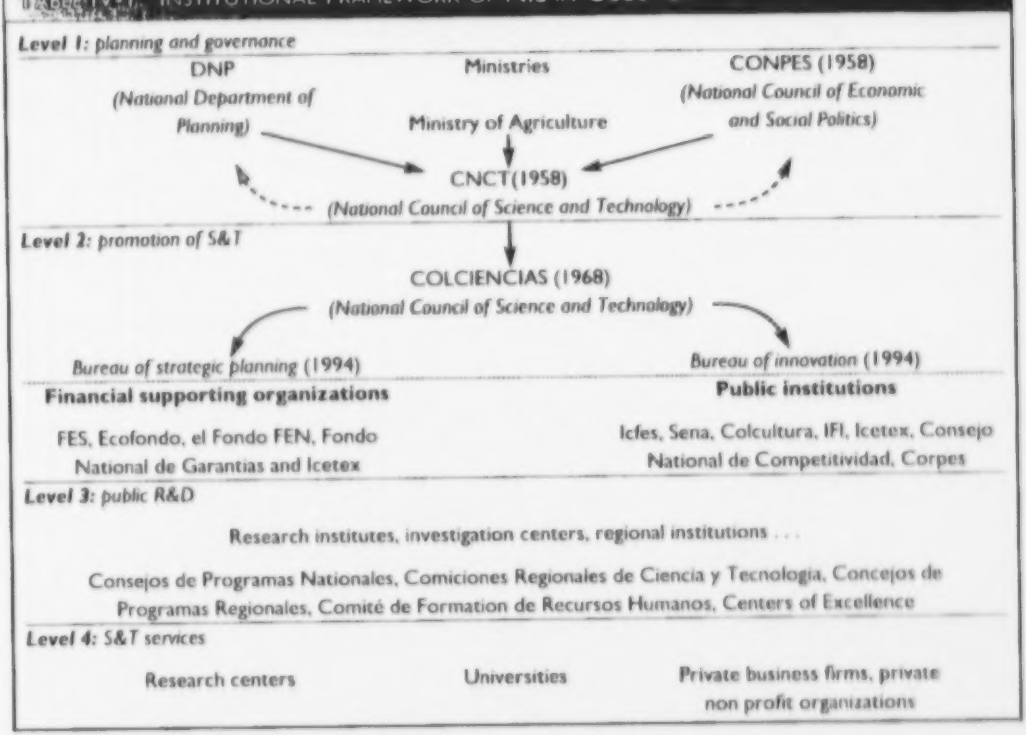
The higher levels of institutional framework (level 1 and 2 in Table IV-1) are much more developed and better coordinated, whereas the number of research institutes, and in particular those that are privately funded, and the collaboration between the lower levels of institutional framework remain underdeveloped (level 3 and 4 in Table IV-1).

Government laboratories are primarily concerned with meeting public needs, while universities and research institutions focus primarily on generating basic knowledge. Universities typically have a more independent research agenda than government laboratories and are therefore less responsive to public policies. However, considering that the government controls much of the research budget of these institutions, university research has become a relevant instrument for policy makers.

Several government-funded programs, such as the creation of centers of excellence (Box IV-2), have been implemented to promote S&T and contribute to economic growth, providing indirect support to business R&D.

Government R&D accommodates public needs (such as defense or health) and serves economic goals when there are market failures associated with R&D. These market failures typically have two causes. First, firms have difficulty fully appropriating the returns to their investment in R&D, so that their private rate of return is lower than the social return. Second, the high risk involved in research may mean that firms hesitate to engage in innovation. This is particularly a problem for small firms with limited access to funding. For the above reasons, the amount firms invest in R&D is likely to be below the socially optimal level (Arrow, 1962).

TABLE IV.1. INSTITUTIONAL FRAMEWORK OF NIS IN COLOMBIA


Level 1: planning and governance
DNP
(National Department of Planning)
Ministries
Ministry of Agriculture
CONPES (1958)
(National Council of Economic and Social Politics)
CNCT(1958)
(National Council of Science and Technology)
Level 2: promotion of S&T
COLCIENCIAS (1968)
(National Council of Science and Technology)
Bureau of strategic planning (1994)
Financial supporting organizations
FES, Ecofondo, el Fondo FEN, Fondo National de Garantias and Icetex
Bureau of innovation (1994)
Public institutions
Icfes, Sena, Colcultura, IFI, Icetex, Consejo National de Competitividad, Corpes
Level 3: public R&D
Research institutes, investigation centers, regional institutions . . .
Consejos de Programas Nationales, Comiciones Regionales de Ciencia y Tecnologia, Concejos de Programas Regionales, Comité de Formation de Recursos Humanos, Centers of Excellence
Level 4: S&T services
Research centers
Universities
Private business firms, private non profit organizations

Government Policy for the S&T Development

The Colombian government adopted a linear approach to the S&T development based mainly on scientific research funding.

The effect of public spending may differ depending on the policy instrument used. Government action typically falls into three categories:

- *Direct funding, including*
  - *a) public expenditures on S&T, social services (like health and education) and public (government or university) research, and*
  - *b) direct government funding of business-performed R&D;*
- *Indirect incentives, including tax exemption, tax deduction or other tax benefits;*
- *Participation in international programs.*

The three policy tools are likely to interact and the effectiveness of one depends on the others. Unfortunately, Colombian government predominantly allocated research resources to the public sector, which could be partly responsible for the lack of university-industry cooperation and a low level of business R&D activities.

Recent OECD studies (OECD, 2000, 2001) show that both fiscal incentives and direct funding stimulate business-funded R&D, whereas research performed by government and universities appears to crowd-out the privately funded research. This suggests that if governments wish to increase business-funded R&D, direct funding is more effective than the indirect supply of knowledge. However, only the latter has been available in Colombia so far.

BOX IV-2: CENTERS OF EXCELLENCE

In 1995, Colciencias accepted 150 applications from S&T institutes for selection for Centers of Excellence. Four were selected, and classified as excellent: Centro Internacional de Fisica (CIF), Centro Internacional de Entrenamiento e Investigaciones Medicas (CIDEIM), Corporacion para Investigaciones Biologicas (CIB), and Fundacion para la Educacion Superior y el Desarrollo (FEDESARROLLO). They were selected on the basis of their contribution to their respective field of science, for their capacity to train investigators, and for their ability to apply the acquired knowledge toward solving tangible problems.[111]

The support for these centers of excellence comes from the national budget; in 1996, about $150 million was allocated to the four centers. None of the centers can support itself from the sale of services or from international funding, which makes them reliant upon the government. The four centers of excellence have proceeded to establish the Foundation of Centers of Excellence, which will be charged with funding, supporting, and evaluating the work and results produced by the centers.

Public R&D expenditures and incentives for private firms innovative activities should be complementary: public research gains in effectiveness when government funding of R&D increases, thereby increasing the capacity of firms to digest the knowledge generated through public research.

Direct Funding

Funding for science and technology in Colombia comes predominantly from the government. In 1993/94, 77% of investments came from public funds, with the remaining 23% coming from the private sector[112] (but only 13% from business enterprises). In 1997, Colombia invested US$632 million, or 0.65% of its GDP in S&T, of which US$398 million was spent in R&D.[113] The gross domestic expenditure on R&D has been relatively consistent since 1994, ranging from 0.62 to 0.70%. While, this level of investment, as percentage of GDP, roughly equals the average for Latin American countries (0.63%), it is noticeably less than the investment of 2.37% of GDP for the North American Free Trade Agreement countries, 1.85% for European Union, or 0.78% for the Mercosur average.[114]

While Colombia spends a similar percentage of GDP for science and technology as other Latin American countries, the net amount of investment does not rival that of Brazil or Argentina. Colombia accounted for 4.4% of the total of US$14.3 billion expenditure on science and technology in Latin America, while Brazil and Argentina accounted for 64.3% and 10.3%, respectively.[115]

Public S&T expenditures have been highly concentrated in the Capital District. Until 1996, the Capital District received all of the public S&T expenditures. Since then, investment slightly increased in other regions, but Bogotá still receives at least 80% of government financing (DNP, OCyT, [2000]).

The three largest government recipients for R&D funding—Colciencias, Ministry of Agriculture and National University[116]—accounted for almost two thirds of total government expenditures for S&T in 1995–1997, whilst the aggregated investments of the top ten institutions amounted to more than 80% of the total expenditures (Table IV-2).

111. Presentacion, Asociacion de Centros de Investigacion y Desarrollo, 1999

112. World Science Report, 1998

113. Red Iberoamericana de Indicadores de Ciencia y Tecnologia (RICyT), 1997, July 1, 1999.

114. Gatti, D., "Latin America: More Funds for Technology, But Still Way Behind," Interpress Service, 981015.

115. RICyT, Gasto en Ciencia y Tecnologia, table 4, http://www.unq.edu.ar/ricyt/indica4.htm, July 1, 1999

116. It is unclear whether the investment through the National University is a real S&T investment or rather a higher education subsidy.

TABLE IV-2: GOVERNMENT INVESTMENTS IN S&T, BY INSTITUTION

	1995		1996		1997	
Institution	US$ (mil.)	% total	US$ (mil.)	% total	US$ (mil.)	% total
COLCIENCIAS	38.50	23.32	58.96	27.37	47.03	27.24
MINAGRIC-DS	38.91	23.57	47.13	21.88	44.86	25.97
UNACIONAL	20.21	12.24	21.91	10.17	21.52	12.46
INGEOMINAS	3.71	2.25	3.79	1.76	4.37	2.53
INPA	4.53	2.74	4.31	2.00	3.91	2.27
FONDANE	6.25	3.79	1.88	0.87	3.69	2.14
MINSALUD-DS	9.18	5.56	6.93	3.22	3.50	2.03
IGAC	4.60	2.79	4.44	2.06	3.43	1.99
MINDESA-DS	4.26	2.58	5.71	2.65	3.29	1.91
INS	1.69	1.02	2.64	1.23	2.30	1.33
MINTRANS-DS	1.93	1.17	3.95	1.83	2.17	1.26

Source: Departamento Nacional de Planeacion- Colciencias, 1994–1998

Note: Converted from Colombian pesos at the 1996 exchange rate of US$ 1 = 1,036.7 pesos).

The Government investment can be further broken down by sector and by type of investment, as in Table IV-3. Such a breakdown shows that 'strengthening the S&T capacity' and 'R&D projects' were the government's priority, receiving the largest fraction of the allocations: on average 53% for 1995–1999. Growing part was allocated to the 'innovation, competitiveness and technological development.'

In 1999, the share of expenditures in basic science slightly increased (2.5% of total S&T investment compared to 0.002% in the average for 1994–1998), whereas experimental development

TABLE IV-3: GOVERNMENT INVESTMENT IN S&T

By Sector	1995 (%)	1996 (%)	1997 (%)	1998 (%)	1999 (%)
Strengthening S&T capacity	47.76	50.60	51.48	54.18	51.98
Innovation, Competitiveness and technological development	29.35	28.54	25.68	24.14	34.09
Science and Social Development	3.25	3.65	2.70	4.93	5.48
Environment	7.30	6.71	9.25	7.62	1.69
Integration of S&T into society	12.16	10.50	10.89	9.14	6.77
By Type of Investment					
R&D Projects	46.49	43.82	57.39	61.84	64.08
Institutional infrastructure	11.55	16.59	14.22	10.69	8.73
Human Capacity Building	6.58	4.53	8.48	7.90	15.73
Diffusion of S&T knowledge and support for acquisition of new technologies	26.27	25.01	7.49	7.92	6.68
Information Systems	9.11	10.04	12.42	11.66	4.77
TOTAL: (In millions of 1995 Pesos)	**151 703**	**196 268**	**173 835**	**118 240**	**117 491**
(In millions of US$)[117]	166,18	214,99	190,42	129,52	128,70

Source: Unidad de Inversion Publica, BPIN, DNP-SENA, Observatorio de Ciencia y Tecnologia

117. Exchange rate in 1995: US$ 1 = 912,9 pesos, as quoted in CIA World Fact Book.

received only 4.1% of investments. Applied and combined research clearly were priority sectors, regrouping 57.5% of the overall expenditures, followed by infrastructure with 28.4%. The rest was allocated to diffusion activities and databases, but their shares diminished to 6.4% and 1.1% respectively (compared to 24.2% and 5.8% in 1995).

In total, the government allocated US$829.81 million in 1995–1999 to S&T, of which 24% was allocated to the agricultural science, 20% to engineering, 8% to natural science, 7% and 5% to social and medical science respectively, and 36% to the combination of sectors.

Indirect Incentives

Considering that governments are less likely than market forces to allocate resources efficiently, the allocation of resources between fields of research may be distorted, as may competition between firms, if some are supported at the expense of others.

The drawback of tax benefits is the opposite of those of targeted funding. Tax breaks discriminate less, so that firms can use public money for any goal, whatever its social rate of return. This may be regarded as an advantage, since it does not distort the research agenda created by market forces.

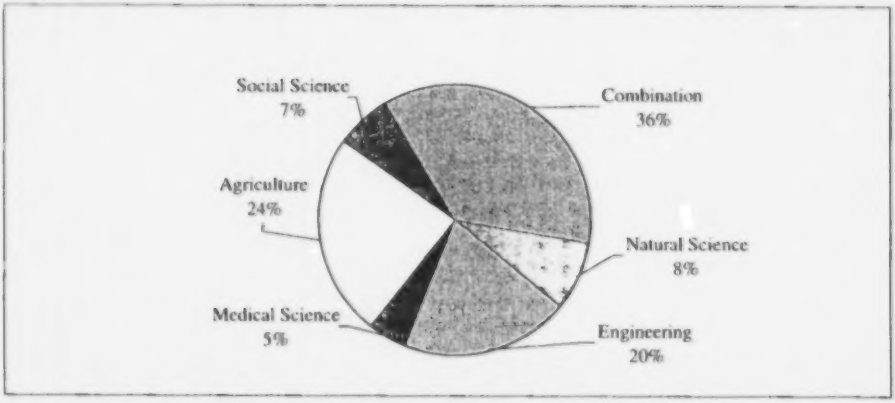
Pursuant to articles 70 and 71 of the Colombian Constitution the government has the duty to promote not only scientific and technological knowledge, but also the entities or persons that are dedicated to these activities. In this regards, Law 29 of 1990 provides guidelines for promoting these activities (i.e. tax exemptions, tax deductions or other tax benefits). This law conditions the granting of the exemptions, tax deductions and other tax benefits to the technological and scientific activities that are recognized by law, with previous approval from Colciencias (MONDAQ, 02/08/01).

Although, according to the law, all organizations can enjoy tax deduction, the public sector, including technical service centers (mostly public), government agencies and public universities, benefits the most, accounting, on average, for 73.7% of tax deduction in 1995–1999.

R&D tax breaks are generally regarded as only weakly discriminatory. However, tax subsidies to private firms are still the exception in Colombia (less than 2% on average).

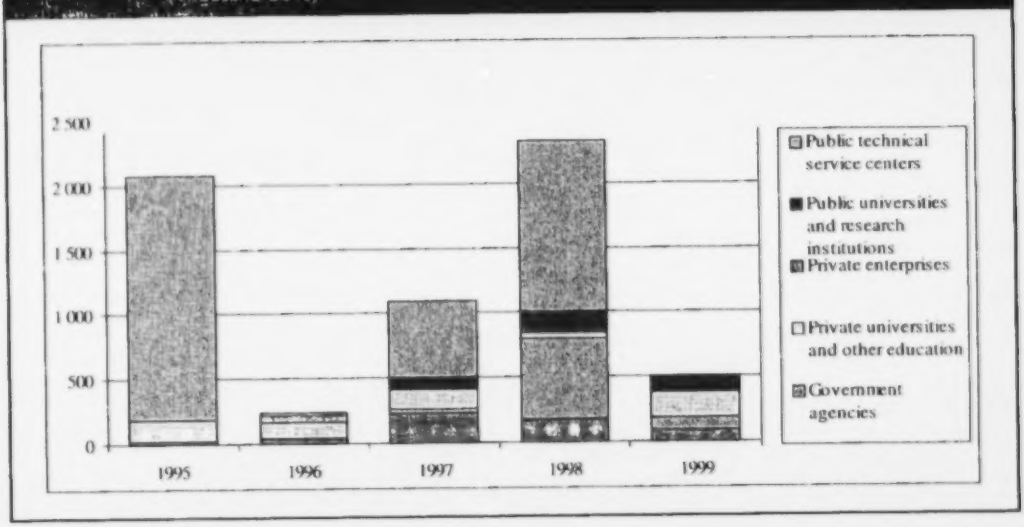
In addition, tax incentives have discriminatory features, as they are not accessible to firms that are not taxed, e.g. young firms where investment exceeds sales. Such companies may, however, be among the most innovative and may also be the most in need of capital, especially considering that venture capital remains largely unavailable for small firms and new enterprises in Colombia (Graph 2.2)

FIGURE IV-4: GOVERNMENT S&T EXPENDITURES BY SCIENCE FIELD IN 1995–1999



Source: Unidad de Inversion Publica, BPIN, DNP-SENA

FIGURE IV-5 TAX EXEMPTION FOR GOODS FOR SCIENTIFIC ACTIVITIES
(Thousand US $)



Source: DNP, OCyT.

International Collaboration

Colombia, together with Mexico and Venezuela, belongs to the Group of Three, a sub-regional cooperation program that provides additional financial support to the S&T sector. Colombia has received a number of loans in support of R&D and innovative projects that were both initiated and generated by the industry. One of the most recent projects is the IDB-Colciencias III, which totals US$200 million.[118]

The World Bank is currently providing funds for strengthening the primary and secondary education projects in Colombia. No higher education projects have been implemented to date.

Protection of Intellectual Property[119]

Colombia does not yet provide adequate and effective intellectual property (IP) protection. As a result, Colombia has been on the "Watch List" under the Special 301 provision of the 1988 Trade Act every year since 1991. An out-of-cycle review in mid-1999 placed Colombia once again in the same "Watch List" category. Colombia has ratified, but not fully implemented, the provisions of the World Trade Organization (WTO) agreement on Trade Related Aspects of Intellectual Property (TRIPS). A major intellectual property rights issue has been the Colombian Government's failure to license legitimate pay television operators and pursue pirate operators.

The weakness of Colombian's IP protection laws is one of the main factors accounting for weak business R&D funding. Private firms are concerned with a financial return on R&D investment, and will rarely fund the research that results in discoveries that benefit the society at large, without giving the firm an opportunity to realize gains on investment. The enterprises thus have to be assured that they will at least have an exclusive opportunity to commercialize the results of R&D.

Nevertheless, serious improvements in IP protection were achieved in several areas. Colombia, which is a WTO member, has ratified the Uruguay Round implementing legislation. It is a member

118. World Science Report, 1998
119. This paragraph is largely based on the U.S. Department of State country report (2001).

of the World Intellectual Property Organization (WIPO) and has negotiated to join the Paris Convention for the Protection of Industrial Property, the Patent Cooperation Treaty and the Union for the Protection of New Plant Varieties.

Patent and Trademarks

Colombia is a member of the Inter-American Convention for Trademark and Commercial Protection. Colombia requires registration and use of a trademark in Colombia to exercise trademark protection. Trademark registration has a 10-year duration and may be renewed for successive 10-year periods. Thus, the Colombian law provides 20-year protection for patents and reversal of burden of proof in cases of alleged patent infringement.

Andean Community Decision 486, which came into force on December 1, 2000, provides improved protection to patents, trademarks, industrial inventions, rules of origin and unlawful competition related to industrial property. This decision, approved after the pharmaceutical industry, which has been particularly affected by inadequate protection of confidential data, requested that Decision 344 be amended to ensure compliance with WTO requirements. Decision 486, eliminates previous restrictions on biotechnology inventions, increases protection of industrial designs from eight to ten years, and protects integrated circuits (microchips) designs. However, Decision 486 appears to have shortcomings with respect to protection of data confidentiality and protection for second-use patents. Enforcement of trademark legislation in Colombia is showing some progress, but contraband and counterfeiting are widespread.

The Superintendency of Industry and Commerce acts as the local patent and trademark office in Colombia. This agency suffers greatly from inadequate financing and a backlog of trademark and patent applications exceeding 25,000, although new applications are now generally reviewed within nine months.

Copyrights

Colombia's 1993 Copyright Law increased penalties for copyright piracy. In April 1999 President Pastrana issued a directive to all government and educational institutions to respect copyrights and avoid the use or purchase of pirated printed works, software and audio/video material.[120] Enforcement problems consistently arise not only with inadequate police activity, but also in the judicial system, where there have been complaints about the lack of respect for preservation of evidence and frequent perjury.

New Technologies

Colombia has a modern copyright law which gives protection for computer software for 50 years and defines computer software as copyrightable subject matter but does not classify it as a literary work. Semiconductor design layouts are not protected under Colombian law.

S&T in the Productive Sector

Colombian economic structure, shown in the Table IV-4, resembles that of other developing countries: it includes a substantial agricultural production, followed by a developing services sector and a robust industry sector.

120. However, the recent data from the International Intellectual Property Alliance (IIPA) suggests that U.S. industries, for example, continue to lose substantial ($163.2 million in 1999) revenue from piracy. The IIPA estimates that in Colombia videocassette piracy represents approximately 55% of the video market; sound recording piracy 60% of the market; business software piracy 56% of the market; and entertainment software piracy 75% of the market.

TABLE IV-4: ECONOMIC STRUCTURE
(% of GDP)

	1980	1990	1999	2000
Colombia				
Agriculture	19,9	16,7	13,8	13,8
Industry	32,5	37,9	28,1	30,5
Services	47,6	45,4	58,1	55,7
Latin American Countries*				
Agriculture	10,1	9,6	8,5	8,2
Industry	39,4	37,3	31,6	32,4
Services	50,5	53,1	59,9	59,5
G7				
Agriculture	3,0	2,0	1,7	1,7
Industry	37,0	35,0	31,0	30,0
Services	60,0	63,0	67,3	68,3

*At the basis of eight countries: Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru and Venezuela.
Source: The World Bank regional database, OECD.

Services

The share of services increased from 47.6% of GDP in 1980 to 55% of GDP in 2000, dominated by community, social and personal services (14% of GDP), retail sale (11%) and telecommunications (7%).

Knowledge-intensive services, such as finance, insurance, communications, health and education, which are intensive users of high technology, demand a relatively highly skilled workforce and help to promote technological innovation. Unfortunately, Colombian statistics are not rich enough to draw a precise picture. Nevertheless, telecommunications and healthcare seem to be the most dynamic knowledge-intensive services.[121]

The services sector plays an important role in the innovation process. For example, the well functioning telecommunications infrastructure affects the development of social and economic networks, necessary for knowledge diffusion throughout the economy. Furthermore, the surveys carried out by the OECD Focus Group indicate that manufacturing firms increasingly interact with knowledge-intensive service firms, establishing co-operative links with consultancies, technological firms or other service firms.

Agriculture

The importance of agriculture, which has been particularly hard hit by Colombia's economic liberalization, diminished over the past 10 years, but, with 13.8% of GDP, it remains one of the most significant economic sectors. Together with the food processing industry (11.2% of GDP), it accounts for 25% of GDP.

Agriculture benefits from absorption agreements, which require domestic food processors to purchase the total production of certain domestic crops at higher than "normal" prices. During 1997, important competitiveness agreements between the private sector and the government resulted in a new policy to improve commercialization of agricultural products by eliminating the Institute of Agricultural Marketing ("Idema") and providing direct compensation to producers instead. In addition, public expenditures for the scientific development of agriculture were higher

121. In 2000, public spending on healthcare amounted at 3,9% of GDP (EUI, [2001]).

than in other sectors—24% of all S&T expenditure, but the high share is insufficient or ineffectual to upgrade the quality of agricultural products. Therefore, the sector continues to lose market shares to foreign competitors. Lack of credit, unqualified labor and the presence of large landholders aggravate the situation.

Industry

Worldwide, industrial enterprises remain the primary institutions for designing and developing new technological artifacts and for applying them in the search for competitive advantage. They also have a major impact on the development of skills and tacit knowledge. All industries are to some extent dependent on knowledge inputs, but some much more than others. The term 'knowledge-based industries' refers to those industries that are relatively intensive in their input of technology and/or human capital (OECD, 1997).

OECD "Classification of industries based on technology" (OECD, 1999, p.106) uses the International Statistic Industrial Classification, second revision with four digits, but only three-digit classification is available for Colombia. Nevertheless, since only tree digits are used to classify low and medium-low technology industries[122] and the fourth digit helps to distinguish between high and medium-high-technology industries, we have regrouped the last two categories into 'knowledge-based industries' for the case of Colombia.

Low technology industries, dominated by food processing (34.5%) and textile (7.1%), stand for the largest part of industrial output. Since trade liberalization, low-technology industries have faced strong competition from Asia, and have become the main receptors of government support—soft credit lines, import subsidies and management assistance. These sectors face new challenge of competitiveness, but their technological development primarily depends on acquired technology and modernization of production tools.[123]

The production of medium-low technology industries is generally for domestic consumption, except petrochemicals and plastic products. These two industries, interrelated with the chemical industry, rely on imported technologies, because their innovation capacity is limited by low labor qualifications, as shown by national industrial survey in 1996 (Table IV-6).

In several case studies, the importance of technology-based activities has been approximated by the share of high-technology industries in manufacturing.[124]

High and medium-high-technology industries in Colombia represented a surprisingly large part of national output in 1987–1996, compared to others LAC countries and even world benchmarking economies. However, the share of high and medium-high-technology industries shrank significantly after the liberalization of the economy, achieving a record low of 5.8% of GDP in 1999.

The evolution of real value added of knowledge-based industries reflect the fragility of Colombian competitive advantage. Continuously increasing in the 1980's, the output of knowledge-based industries first broke down just after the trade liberalization, but then recovered after the inflow of foreign investment in this sector. Nevertheless, the investors were discouraged by poor factor conditions, especially of human capital and political instability, and the sector is at loss of productive capacities compared to its 1987 level. The only exception is chemical production (including pharmaceuticals). Being one of the most dynamic industries, it accounts for slightly more than half of the production of knowledge-intensive industries, and despite the 1999 crisis, the output reached 113% of 1987 volume.

122. The only exception is for transport equipment (Shipbuilding and repairing (3841)—medium-low-technology industry, Aircraft (3845) –high-technology industry, and the rest—motor vehicles and other transport equipment—medium-high-technology industries). Colombian main transportation production is automotive, categorized in medium-high-technology industries.

123. As shown for other countries in OECD studies (OECD, 1998, 2000, 2001).

124. Especially by OECD studies, but also by European Commission.

TABLE IV-5: STRUCTURAL COMPOSITION OF COLOMBIAN INDUSTRY BY KNOWLEDGE INTENSITY
(% of industrial output)

	ISIC Rev. 2*	1974–1983	1984–1993	1994–2000
Low-technology industries		**56,58**	**53,08**	**52,88**
Wood products & furniture	33	1,09	1,01	1,05
Food, beverages & tobacco	31	33,69	32,83	34,46
Textiles, apparel & leather	32	15,55	12,63	10,09
Paper, paper products & printing	34	6,24	6,61	7,28
Medium-low-technology industries		**21,59**	**22,36**	**24,05**
Ferrous metals	371	2,64	3,17	2,32
Petroleum refineries & products	353+354	5,52	4,90	6,94
Metal products	381	3,75	3,26	2,97
Non-metallic mineral products	36	4,33	4,90	5,71
Non-ferrous metals	372	0,58	0,56	0,51
Rubber & plastic products	355+356	3,95	4,75	4,90
Other manufactures	39	0,81	0,82	0,71
Knowledge-based industries**		**21,83**	**24,56**	**23,08**
Non-electrical machinery	382	1,90	1,70	1,72
Transport equipment	384	5,21	5,52	4,46
Chemicals	351+352	11,65	13,82	14,24
Electrical machines	383	2,80	3,01	2,16
Professional goods	385	0,28	0,52	0,51
TOTAL		100	100	100

*Adapted to the three-digit classification.

**High and medium high technology industries, including shipbuilding.

Source: DANE-EAM, 2001; OECD, 1999

TABLE IV-6: LIMITATIONS TO INNOVATION
(% of firms perceiving the input as an obstacle)

	Research capacity	Economic & financial	Human capital
Petrochemicals	29.2	31.3	**91.0**
Plastic products	49.8	55.3	**62.2**
National average	*502*	*50.9*	*55.3*

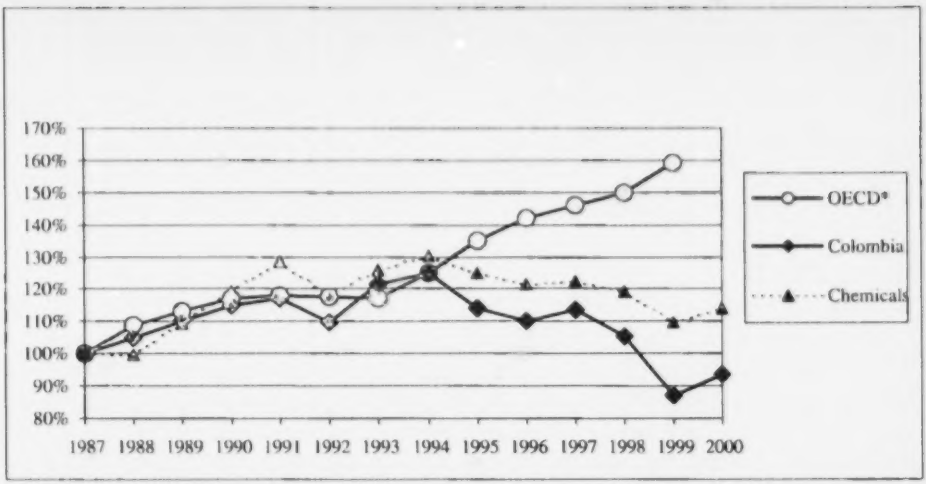
Source: Colciencias and DNP, [1996], OCyT, [2001], *Encuesta sobre Desarollo Tecnologico en el Establecimento Industrial Colombiano, 1996.*

TABLE IV-7: VALUE ADDED OF HIGH AND MEDIUM-HIGH TECHNOLOGY INDUSTRIES
(Share of GDP, 1996)

Colombia		Mexico	USA	Korea	France	Spain	OECD
1987–1996	9.0%	8.2%	9.1%	13.8%	10%	8.8%	9.8%
1996–2000	6.7%						

Source: DNP, OECD.

FIGURE IV-6: HIGH AND MEDIUM-HIGH TECHNOLOGY MANUFACTURES
(in real valued added)



*1987–1996: calculated with all OECD countries excluding Luxembourg, Poland and Turkey. 1997–1998: data available for France, Germany, Italy, Japan, United Kingdom and United States. 1999: the average is calculated for Italy, Japan, United Kingdom and United States.
Source: OECD [1999], [2001].

Business R&D Funding

The R&D funding by business enterprises is inadequate in Colombia; while it slightly rose in mid 1990's (from 8% in 1994 to 13% in 1997), it dropped after the financial crisis in 1999 (Table IV-8). Whereas the share of business funds in R&D is close to 60% of overall investment in the developed countries, it remains around 30% in the most dynamic developing countries. Collaborations between universities and industry are still nascent.

BOX IV-3: POSSIBLE CLUSTERING IN CHEMICAL INDUSTRY

The chemicals industry (including pharmaceuticals) is the second largest manufacturing sub-sector in terms of value added—at around 15%—and has grown steadily. The industry, dominated by multinational companies, exports 38% of total production; foreign sales reached US$1.7bn in 2000, a conciderable increase on the US$235m registered in 1990. The industry has been one of the main beneficiaries of the lowering of trade barriers, which reduced the cost of imported inputs, while easing technology transfer through increased flexibility of foreign investment and currency regulations.

Producing pharmaceuticals, fertilizers, insecticides, acids and alkalis, cosmetics, detergents and paint, chemical industry has important spillovers into most important domestic sectors, such as agriculture, food production and textile. Altogether, with less knowledge-intensive petrochemicals (7%) and plastic products (5%), chemical production accounts for 27% of industrial output.

Under favorable conditions, chemical industry could serve as a basis of a highly technologically developed cluster having multiple beneficial effects on the rest of the economy.

Source: EUI Country Study, [2001], U.S. Department of Commerce, DNP and OCyT data.

TABLE IV-8: PRIVATE PARTICIPATION IN FUNDING OF R&D, 1993–1997
(% of total)

Colombia	Mexico	USA	Korea	Turkey	Spain	OECD
10.6%	16.0%	61.0%	74.4%	33.8%	43.4%	60.4%

Note: For Colombia the average of 1994–1997, for Mexico—1993–1995, for Korea 1995–1997.
Source: RICyT, OECD.

Research Activities by Size Classes of Firms

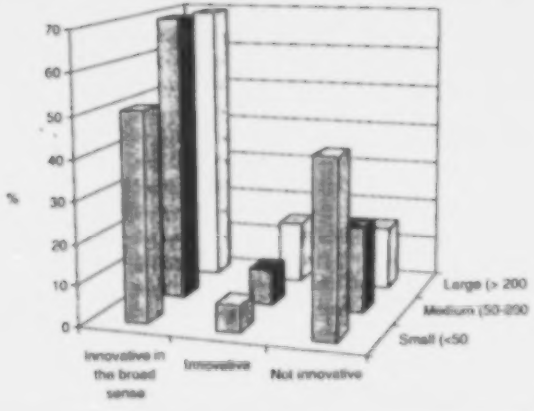
Not surprisingly, large enterprises innovate more than small and medium enterprises (SME) in Colombia, especially with regards to the in-house research. They benefit from better investment capacities and more qualified labor than small Colombian firms: 47.3% of employees have professional qualification in large firms, compared to only 6.2% for small firms and 25.1% for medium-size firms (OCyT, [2001]). Unfortunately, international comparison is impossible due to methodological differences in Colombian and OECD studies.

Inter-firm Co-operation

Several studies show that the co-ordination of an innovative endeavor almost always requires a network of independent organizations with different competencies. To a large extent, innovation is the result of inputs from co-operative systems, networks of firms and knowledge-based organizations.[125] However, co-operation agreements are embryonic among Colombian firms, especially smaller ones.

The nature and potential benefits of network co-operation are not always well known in small firms. New business models are more difficult for them to consider due to the lack of highly skilled

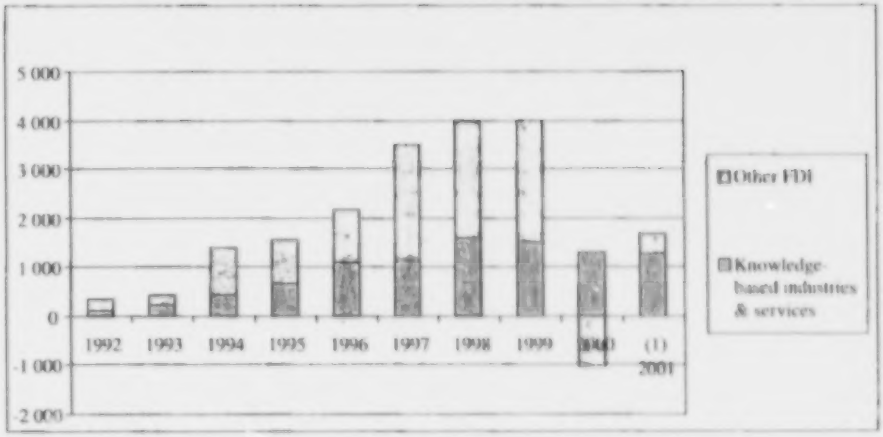
FIGURE IV-7: INDUSTRIAL FIRMS DISTRIBUTION BY SIZE AND INNOVATION ACTIVITIES, 1996



Source: OCyT, [2000]

125. The Community Innovation Surveys (CIS) as well as the CATI surveys carried out in the OECD Focus Group show that firms rarely innovate alone. The CATI survey showed that 61% of the product-innovating firms in Austria collaborated with one or more partners, 83% in Spain and as high as 97% in Denmark.

FIGURE IV-8: FDI, EXCL. OIL



Source: DNP

employees. Furthermore, their managers may be afraid to lose competitive advantages to prospective partners. The recent programs of the Colombian government and business associations (Centros de Desarollo Tecnologico, Centros Regionales de Productividad, Incubadoras de Empresas de Base Tecnologica) try to promote firms' awareness of networking, but no statistical evidence can attest to the success of these policies.

Foreign Direct Investment

Trade and foreign direct investment (FDI) remain significant sources of innovative ideas and concepts and may take on greater importance as the complexity of innovation at the technological frontier makes it increasing difficult for individual firms and countries to engage in innovation.

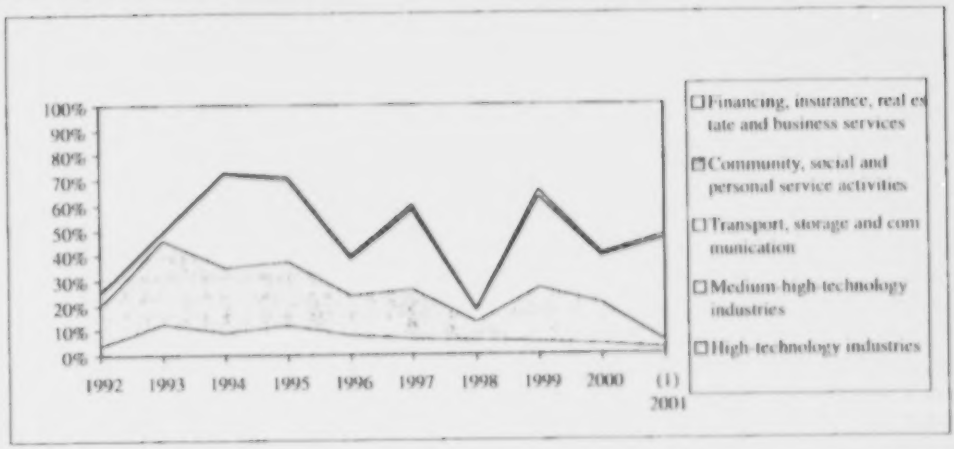
In Colombia, foreign investment grew by an annual average of 55% between 1991 and 1997, compared with 15% in the 1980s.[126] However, FDI fell sharply in 1998, owing to a marked slowdown in privatizations and flagging investor confidence. The total stock of foreign investment in Colombia was close to US$2bn in 2000. Although the US continues to hold the largest share, this country's participation declined throughout the 1990s in favor of Latin American countries and the EU.

High-technology industries have experienced the greatest increase in international trade during the early 1990s. The telecommunications, manufacturing and finance sectors have increased their share of the FDI stock in recent years, whereas the share of mining has declined. Besides its positive effect on national S&T capacities, investment in knowledge-based industries proved to be much more persistent than investment in other sectors. Foreign investment in high and medium-high-technology industries and services was the only to remain at the same level during the economic recession, whereas it felt down in all others (Figure IV-8).

The structural composition of FDI reflects the attractive growth of services, especially telecommunications and finance sector, for foreign investors. However, the decreasing share of FDI in knowledge-based manufacturing reflects the low level of Colombian competitive advantages in this area (Figure IV-9).

126. Including portfolio and oil.

FIGURE IV-9: FDI IN KNOWLEDGE-BASED INDUSTRIES AND SERVICES



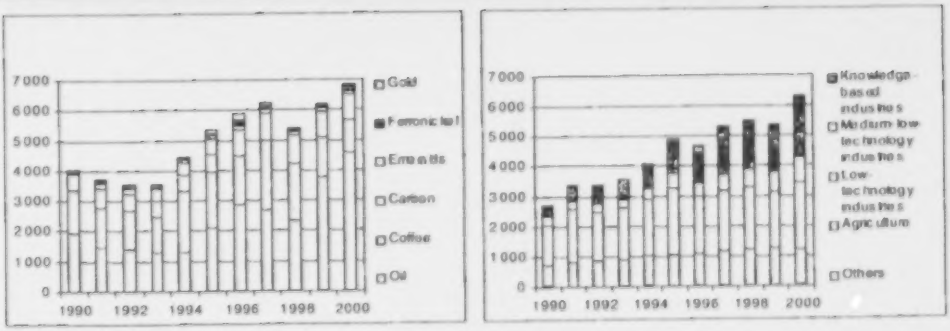
Source: DNP

The External Sector

The share of manufactured exports is still low, and Colombia is heavily dependent on row material exports accounting for 43.8% of the export in 2001 (primary oil—34.8%, and carbon—6.6% (DANE, 2001)). However, the export of knowledge-based industrial products increased not only in volume (from US$ 0.4 billion to US$2.1 billion), but as share of non-traditional export: from 14% in 1990 to 32% in 2000 (Figure IV-10).

Although capital goods, raw materials and other inputs for the industry are by far the largest categories of imports, imports of consumer goods have also risen steadily. As a share of total imports, consumer goods increased from 12% in 1991 to 19% in 2000, while the share of capital goods fluctuated between 30% and 40%.

FIGURE IV-10: COMPOSITION OF TRADITIONAL AND NON-TRADITIONAL EXPORT
(million US$)



Source: DNP

Scientific instrument represent only 3.6% of all exported goods, whereas all high-technology goods comprised 6.7%. Colombia does not take full advantage of international trade, since high-technology goods account for approximately 20% of trade in OECD countries, and more than 60% together when combined with medium- high technology industries (35.8% for Colombia).

Factor Conditions

Colombia is a country of outstanding natural resources, but with the third largest population in the Latin America, its most valuable possession is, without any doubt, human capital. Although living conditions improved considerably over the last decades, regional and social disparities remain pronounced. The population is overwhelmingly urban (74% according to DNP), with approximately 30% of people living in four biggest cities.

Whereas Colombia is making progress with respect to providing better healthcare and living conditions, the professional skills of its labor force need considerable improvements. On average, 55.3% of Colombian industrial firms indicated low qualified labor as one of the most important obstacles to innovation, and this share is even higher in selected industries, like steel or glass production (66%), and petrochemicals (91%) (OCyT, [2001]). The competitive edge of the country's economy is and will be determined by its' people ability to create, acquire, share and use knowledge effectively (WDI Study, [2001]).

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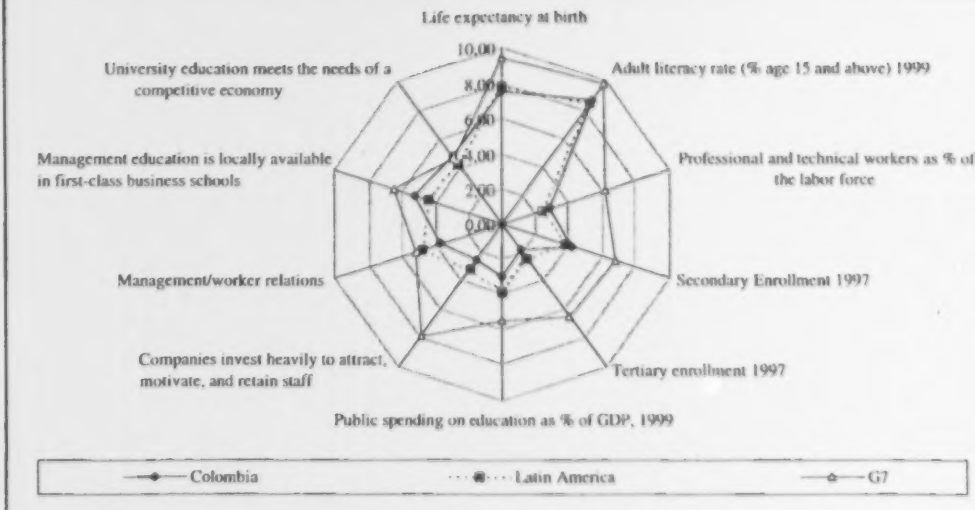
Although the information economy is accompanied by an increasing codification of knowledge, much knowledge remains tacit, embodied in people's skills, experience and education. Human capital is therefore crucial to the innovation process, and surveys point to the lack of skilled personnel as one of the greatest barriers to innovation in Colombia.

FIGURE IV-11: HUMAN RESOURCES


Life expectancy at birth
10,00
8,00
6,00
4,00
2,00
0,00
Adult literacy rate (% age 15 and above) 1999
Professional and technical workers as % of the labor force
Secondary Enrollment 1997
Tertiary enrollment 1997
Public spending on education as % of GDP, 1999
Companies invest heavily to attract, motivate, and retain staff
Management/worker relations
Management education is locally available in first-class business schools
University education meets the needs of a competitive economy
Colombia
Latin America
G7

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Education System

Public spending on education was equivalent to 3.6% of GDP in 2000, compared with just 2.5% at the end of the 1980s. While this percentage spending exceeded that of Chile or Peru, it remains below the regional average (Graph 5.1). The average years of schooling attained by the population was estimated at 6.7 years in 1997, and the government has set the target of an average of 9 years by 2007 in the 7 largest cities, and by 2017 in the rest of the country. The rising real per-capita spending on education over the past 20 years has led to a wider coverage for both secondary and higher education (of 65% and 16%, respectively, in 1999), as well as to notable improvements in basic literacy, which, at over 90%, is the second highest in Latin America.

The higher education and training systems does not match qualifications needed by technologically intensive industries and those of the labour force. Shortages of specific categories of highly skilled personnel, such as ICT workers and scientists and engineers, became flagrant in recent years, a potential sign of specific rigidities in these areas. The share of students in natural science and engineering is considerably lower than on the regional average and in the United States (*Source:* RICyT (2000).

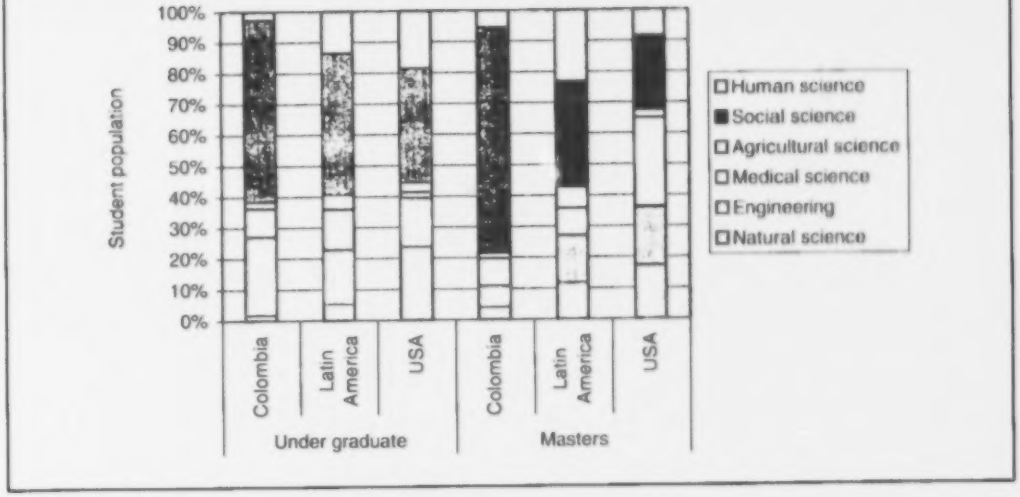
The number of higher education institutions rose from 225 in 1985 to 269 in 1997 and the number of students registered in postgraduate studies increased by six fold over the same period. However, the tertiary enrollment is only 16% and qualitative improvements have been modest. The educational system is extremely centralized and teachers remain poorly qualified, particularly in rural zones. Secondary education does not provide vocational skills, and industrial and services employers complain of shortages of skilled labor.

Information Infrastructure

The most developed element of the Colombian NIS is its information infrastructure, which, according to several indicators, is approaching the G7 level (Figure IV-13).

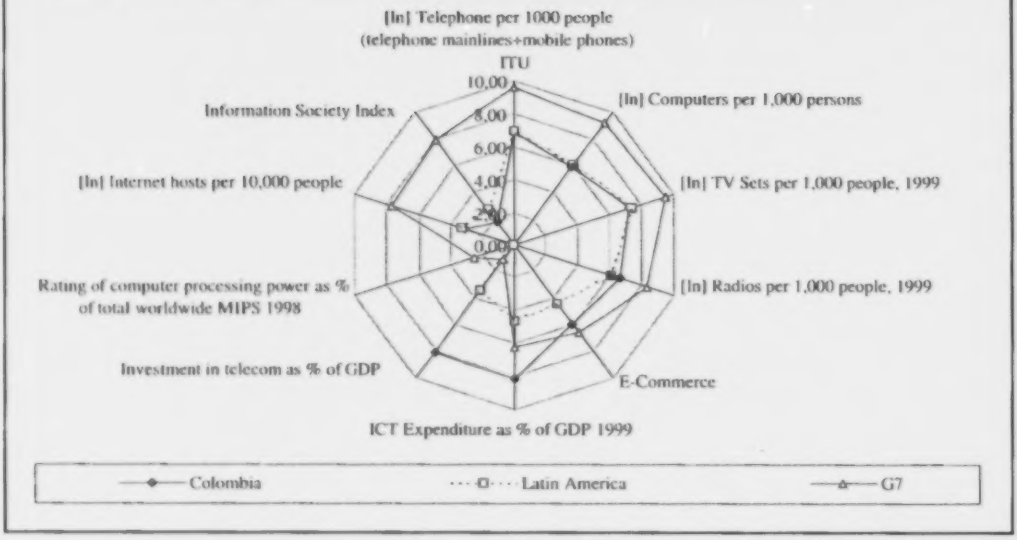
Telecommunications, liberalized in the 1990s, is one of the most dynamic sectors of the Colombian economy and now accounts for around 7% of GDP. Turnover for the sector passed US$2bn in 2000. The telecommunication system is well-developed compared with other countries

FIGURE IV-12: COMPOSITION OF UNIVERSITY STUDENTS, 1996



Source: RICyT (2000)

FIGURE IV-13: INFORMATION INFRASTRUCTURE



in Latin America. Colombia ranked third in terms of telephone coverage in the region, with 16 lines per 100 inhabitants, behind Argentina and Chile, which have 20 and 17 lines per 100 inhabitants, respectively.

The Internet remains outside the reach of most people, but lately improved considerably, and the e-commerce is at the level of the most developed countries.

Scientific Activities

Colombian contribution to basic scientific research is limited. The total number of articles published by Colombian researchers in international journals is much less than either Argentina's or Brazil's—both of which spend a smaller fraction of their gross national product on research and development than Colombia (Figure IV-14).

The agricultural science and biology, privileged by government subsidies as mentioned in the previous chapters, provided more articles than other science fields. The number of publications in chemical and physical sciences is slightly increasing, which is probably one of the spillovers of the development of chemical industry (Figure IV-15).

Furthermore, scientific output, as measured by the number of patent applications,[127] is lower than that of other countries with similar, or even smaller GNP. In 1998, Colombia had disproportionally fewer resident patent applications (0.018 per 10,000 people) than the United States (5.01) or Canada (1.60), and noticeably less than Argentina (0.24) and Chile (0.29).[128] While the total

127. Patent applications are just a proxy (albeit possibly the best one we have) for measuring innovation, as incentives to patent may play a large role as to whether people actually expend the effort to patent their inventions. The incentives to patent may be reduced by weak IP protection, low entrepreneurial culture in innovation activities, and others.

128. Two sources of data was used in this paper: RICyT 2000, data available for invention patent publications in 1991–1998, ranged in two groups—residents and non residents; OCyT 2001 data available for 1995–1999 for all patent applications, including process innovation and industrial design, ranged by science field.

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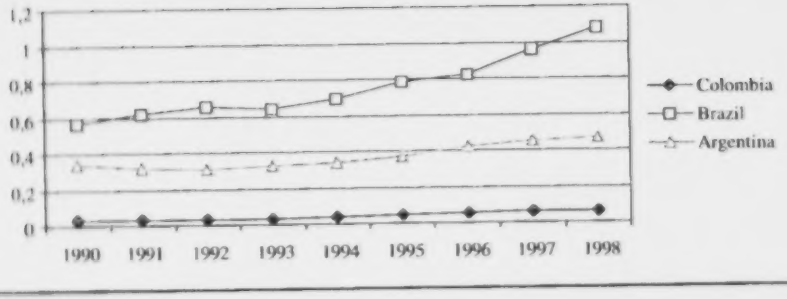
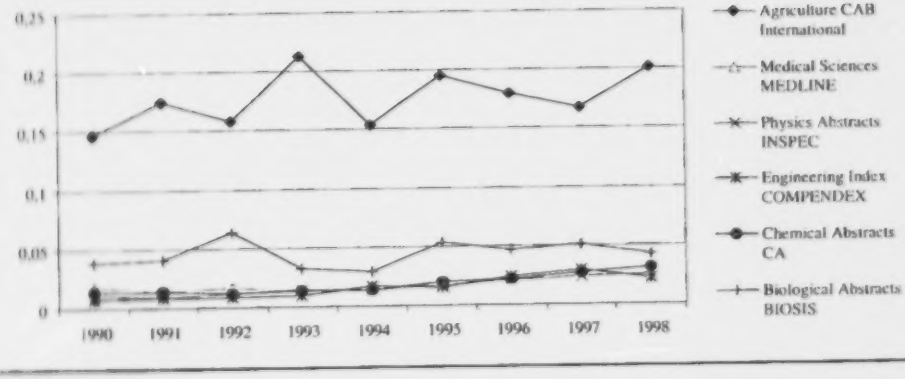
FIGURE IV-14: PUBLICATIONS IN SCIENCE CITATION INDEX
(% of total)



Source: RICyT, [2000]

FIGURE IV-15: COLOMBIAN CONTRIBUTION TO SELECTED SCIENTIFIC DATABASES



Source: RICyT, [2000]

number of applications has grown during the last decade, Colombian self-sufficiency rate—0.04—is still very low compared to that of Chile—0.15—or Argentina—0.14.[129] Most patent applications are (i) product innovation followed by (ii) industrial design and (iii) process innovation (Figure IV-16).

The classification of patent applications by science field reflects the importance of chemical science for Colombian NIS, especially for scientific research.

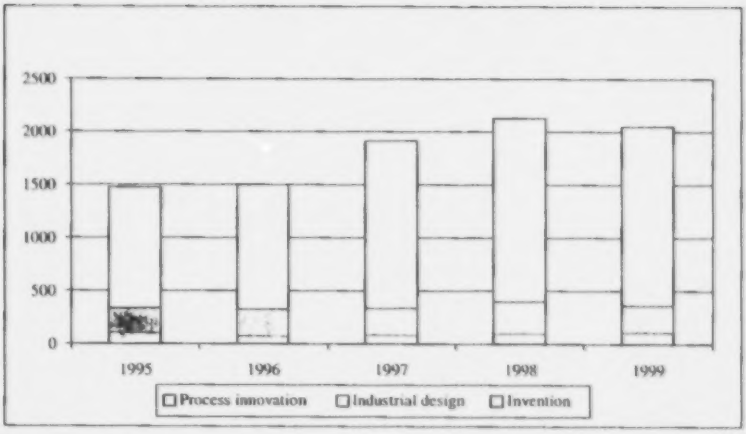
In 1999, over 70% of patent applications were in the field of chemical sciences: chemistry (11.8%), chemical engineering (24.2%) or pharmaceuticals (38.7%).

Conclusions

On the whole, the major elements of innovation system are present, but underdeveloped due to a series of constraints: lack of investment and limited critical mass, inadequate scientific and educational

129 The self-sufficiency rate is calculated as ratio of residents' patent applications to the non-residents patent application.

FIGURE IV-16: PATENT APPLICATIONS IN COLOMBIA

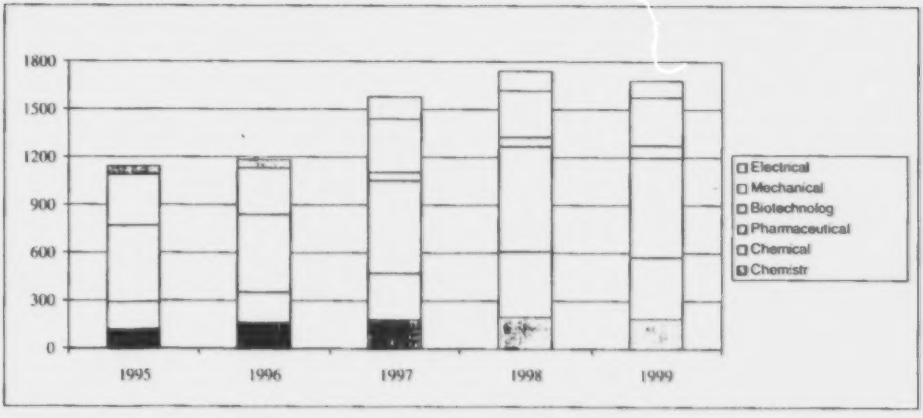


Source: RICyT, [2000]

infrastructure, and limited access to skilled labor. Despite several fundamental advantages and recent improvements, the Colombian NIS appears to be dysfunctional, characterized by limited information sharing and general weak links between actors (Table IV-9 summarizes the study's main findings).

Studies on technological development recognize State intervention as one of the key elements leading to technological catch-up, (Poti and Basile, 2000). In Colombia, as in other developing countries, the underdevelopment of S&T arises as a consequence of several shortcomings: institu-

FIGURE IV-17: PATENT APPLICATIONS IN INNOVATION BY SCIENTIFIC FIELD



Source: RICyT, [2000]).

TABLE IV-9: STRENGTHS AND WEAKNESSES OF COLOMBIAN NIS

Strengths	Weaknesses
Institutional framework	
— Institutional stability	— Political instability and violent conflicts
— Developed higher levels of institutional framework (as described in chapter 3)	— Unbalances public expenditures
	— Poor coordination between lower levels of institutional framework
	— Poor regulation of IP protection
Productive system	
— Dynamic chemical industry	— Underdeveloped knowledge-based industry
— Rising FDI investment in knowledge-based industries and services	— Competitive advantages are related to the exchange rate rather that products quality and cost-efficiency
	— Nascent business participation in R&T activities
	— Low level of high-technology products in trade
Factor conditions	
— Well developed information infrastructure	— Limited access to skilled labor
— Dynamic telecommunication sector	— Unbalanced education structure (natural science studies are underdeveloped compared to social sciences)
— High level of entrepreneurship	
— Flexibility of population	
Scientific research and experimental development	
— Positive spillovers from chemical industry	— General low level of research activities among residents
— Relatively high level of research in agricultural science	— Nascent collaboration between industry and universities
	— High dependency rate
	— Low share of business-funded research

tional shortcomings,[130] inadequate provision of infrastructure, market failures, under-investments in human capital and transition failures.[131] The following section suggests general initiatives that could be taken to improve scientific and technological capacities in Colombia.

Institutional Shortcomings

Upgrading Institutional Regime and Innovation Incentives

Assure a proper political and legislative framework. In order to develop sustainable growth, attract foreign investment and promote innovation in everyday life, Colombia needs, first and foremost, to assure political stability and an adequate rule of law. Income and regional inequalities further contribute to the growing social tensions and any knowledge strategy needs to take full account of this factor.

Long-term consistent S&T development policies. Any type of government support for business R&D is more likely to be effective if it is integrated within a long-term framework, thus reducing the uncertainty that firms face. Moreover, the various policy instruments should be consistent; this implies co-ordination among the administrative departments involved in design and management.

Provide tax incentives for private sector R&D. Tax incentives are a powerful government instrument that leaves the allocation of R&D resources to the market forces.

130. For instance, poor regulation of property rights in Columbia and political instability.

131. Transition failures are failures to pursue new technological opportunities and markets, (Poti and Basile, 2000).

Strengthen IP protection. Assuring adequate and effective intellectual property (IP) protection is one of the main conditions for the development of business R&D investment and private innovation activities.

Inadequate Provision of Infrastructure

Promote FDI in knowledge-based sectors. Foreign investment in high technology industries appears least influenced by economic fluctuations.

Taking advantage of information infrastructure. Being one of the most dynamic sectors, telecommunications is not only a tool to diffuse knowledge, but also a highly knowledge intensive and rapidly expanding sector, which could be at the basis of other knowledge-based cluster. It could also encourage international collaboration and facilitate the access to the world knowledge.

Market Failures: Promoting Entrepreneurship and Knowledge-based Industries

Promote SME development. Reduce bureaucracy and regulatory hurdles to establish new enterprises and provide access to finance, business skills, technical and marketing innovation. Furthermore, create a more even playing field for the development of small and medium size enterprises across all economic sectors. In emerging areas where demand patterns are unclear, risks are large and technology has not yet been worked out, small firms have an advantage over large established firms. They can be more flexible and more specialized and may also be better than large firms at channeling creativity and providing the right incentives for their employees. New mechanisms such as venture capital and the associated entrepreneurial expertise, may allow these firms to grow rapidly.

Develop knowledge-based industries. The positive spillovers of the chemical industry attest to the benefits of creating a favorable environment for the emergence and development of knowledge-based industry.

Promote trade of technology-intensive products. Trade promotes innovation, technology transfer and knowledge sharing.

Under-investment in Human Capital: Upgrading Education and Learning Systems

Promote higher education. A solid education and general entrepreneurship are necessary factors to enable Colombia to catch-up with the scientific level of developed countries. Promoting and concentrating graduate science education (and other key disciplines) in centers of excellence would further improve the NIS.

Tailor education to meet the needs of the industry. To increase the number of tertiary students and qualified personnel, create incentives for life-long learning. The number of people who graduate with a degree in natural sciences and engineering seems to be disproportionately low compared to the number of people graduating with a degree in social science.

Transition Failures: Improving Research and Development Capacities

Promote basic research. The gap between private and social returns is likely to be the highest in basic research, which is the main reason behind strong government involvement in this area.

Stimulate the performance of R&D by business. Government may either reduce the private cost of R&D or help firms understand the technological opportunities available, thus reducing both the cost and uncertainty of research. If such policies are effective, public and private funding may be complementary to each other, benefiting both. Government (targeted) funding of business R&D can also reduce barriers to the transfer of knowledge from universities.

Focus on the needs of the industry, especially knowledge-based sectors. An accelerated development of Colombia's economic and scientific achievements is best achieved through a prioritization of the country's existing technology-intensive industries, the chemical industry and pharmaceuticals. Furthermore, policy intervention on linkages, competence-enhancing activities, and public procurement seems to be more important determinants of industrial innovation than financial incentives and market structure. Therefore, the main focus should be put on:

Developing industry-university collaboration. The development of industry-science relationships requires innovation in the financing of public/private partnerships, including equity investments by the public sector, cost- and risk-sharing arrangements and third-party involvement. Furthermore, indirect incentives reflecting the needs of private firms could be a powerful government policy tool to promote industry-university collaboration and business R&D investment.

Develop industrial clusters and promote inter-firm collaboration. Inter-firm collaboration has in the past proved to be one of the most successful ways to promote knowledge diffusion throughout the economy.

Annex V

Colombian Higher Education in the Global Market

Prepared by Isabel Cristina Jaramillo, Patricia Garcia, and Andreas Blom

Introduction

Two concepts lie at the core of this paper, internationalization and globalization of higher education. Following the definitions of Knight (1999) these concepts differ from each other, but are, at the same time, intimately linked.

Globalization is understood as increasing flows of technology, investments, knowledge, people, values, ideas, etc. facilitated by new communication technologies. This paper demonstrates that the current globalization process has significant implications for the higher education sector in Colombia. Hence, higher education institutions in Colombia have come under pressure from foreign universities, who use the Internet as a tool to gain access to the Colombian market for higher education. Moreover, globalization has revitalized the issue of brain drain, which in the case of Colombia has translated into a significant loss of skilled labor.

Internationalization, on the other hand, can be seen as a strategic response to globalization. In the words of Knight, internationalization is defined as a process of "integrating an international/ intercultural dimension into the teaching, research and service functions" of any given education institution (Knight, 1999: 16). Accordingly, one of the rationales behind internationalization is that higher education institutions will benefit from exposure to and collaborations with foreign institutions. Therefore, increasing internationalization is in the case of Colombia expected to improve the country's access to international best practices and the global pool of knowledge.

Internationalization can happen through various channels. This paper pays particular attention to the importance of overall government support, student exchange programs and international networks designed to promote collaboration between academia across countries, cultures and religions.[132]

132. The internalization process depends on the various economic, political, geographic and demographic factors. For instance, internationalization requires among other factors (i) economic resources to fund projects, (ii) the existence of communication infrastructure, (iii) political stability to allow bi-directional exchanges and (iv) language skills. These conditions lie predominantly outside of the tertiary education sector's sphere and are therefore not treated in this paper.

Globalization is a broad concept involving changes at numerous levels. Still, not all of these processes have equally direct implications on the higher education sector, but two trends are believed to be of particular importance. First, the emergence of a global market for higher education poses significant challenges to the institutions that are part of this educational level Colombia. Second, globalization has fuelled a significant increase in the outflow of human capital from the country (brain drain).

Towards a Global Market for Higher Education

The global market for higher education has been growing significantly in recent years partly facilitated by the advent of new communication and information technologies and the General Agreement on Trade in Services (GATS) adopted at the end of the Uruguay Round (1987–1994). Similar agreements have subsequently spread to several regional free trade agreements (CHERD, 2001). As a consequence, global trade in higher education amounted to around US$30 billion in 1999 (11% more than in 1995). Notwithstanding the GATS agreement, the market regulation remains flawed. Hence a recent seminar on the issue pointed out that questions of quality assurance and accreditation remained unsettled (CHERD, 2001).

Colombia has become an important market for international universities, due to limited coverage and low international exposure of domestic institutions, particularly at master and doctoral levels. In recent years, the country has seen a growing presence of international universities from Cuba, Spain, and lately Australia. However, there is growing concern about the quality of such programs since the accountability issues for such "multi-national" university programs have yet to be defined. Still, the Ministry of Education and ICFES have established similar criteria for the establishment of higher education institutions, national and international alike, which should level the "playing field."

Brain Drain

"Mobility of highly educated labour is perhaps the most obvious mechanism of knowledge transfer" (Graversen et al., 2002, see also Annex I[133] where the rationale is further explained). However the flow of people has to go both ways if all countries are to benefit from labour mobility. Unfortunately, emigration of highly qualified individuals from developing countries has been a concern for several decades. This also applies to Colombia. As a consequence, the *Departamento Nacional de Planeación* (DNP, National Planning Department) estimated that from 1998 to 1999, 85,000 Colombians with college studies emigrated. This represented a calculated loss of US$2,365 millions, which more or less equals the amount invested in higher education over the last three years. The same study reported that additionally 5,200 persons who attended higher education institutions abroad did not return to Colombia in the previous three years, from 1999 to 2001.[134] Colombian communities in the two typical countries of destination, USA and Spain, have swelled during the last decade where both push-factors for emigration (escalation of the violent conflict and severe economic recession) and pull-factors (economic prosperity in countries of destination and easing of immigration laws) have attracted a growing number of highly educated Colombians. New Zealand, Australia and Costa Rica are also emerging as poles of attraction.

A recent study by Carrington and Detragiache (1999) estimated the extent of brain drain on the basis of 1990 US Census data. In almost all cases, individuals with tertiary education formed the highest percentage of immigrants. Only countries geographically close to the US (Mexico,

133. This paper focuses on academic mobility. Nevertheless, productivity is also enhanced by mobility from research centers to firms and vice versa.

134. The newspapers sources, *Tierramerica/Inter Press Service* and *Diario El Pais* differ on the estimated amount of college emigrants that the DNP study presented, between 80,000 and 85,000.

Central America, and the Caribbean Countries) had higher percentages of immigrants with secondary education rather than tertiary. Immigrants with primary school education were a distant third (7% of total immigrant population) (see Annex II).[135]

For Colombia, Carrington and Detragiache found that 8 percent of Colombians with higher education had opted to leave their home country to work elsewhere. However, the study draws upon data from 1990. More recent anecdotal evidence suggests that the Colombian economy has suffered an even stronger loss of highly skilled human capital over the last decade.[136] However, no systematic data is so far available.

Still, emigration does not always represent an absolute loss to the country of origin. Many people maintain beneficial links to their countries of birth, becoming conduits for knowledge and technology transfer. Others may re-emigrate later in life, with vastly enhanced professional skills and experience. Nonetheless, the magnitude of the problems calls for the attention of policymakers.

Recent economic analysis shows that educated individuals become more productive (and therefore receive a higher wage) after they immigrate. It is not true, as some economic theories would hold, that as a scarce resource in the developing world, educated people command a higher wage premium than they would in the industrialised countries members of the OECD, where educated workers are already abundant. Instead, it seems that the presence of other educated individuals (the so-called "critical mass") raises the productivity of all. An educated individual in isolation—as many find themselves in developing countries—is not able to capitalise on that education. Individuals with advanced training (advanced human capital) must be surrounded by their peers in order to become productive.

Internationalization

Against this backdrop of increasing globalization, this section will review past internationalization initiatives in Colombia. The section will start by looking at the political commitment to internationalization of higher education. The subsequent parts will review specific initiatives undertaken with a view to promote student exchange and joint research activities, respectively. Hence, the assumption is that a successful internationalization strategy will contribute significantly to counter some of the problems listed in the section above. However, it should be noted that internationalization does not *per se* provide the solutions for all of the challenges listed above. The problem of brain drain for example, must be countered through various policy initiatives. Policy-makers must not only increase the opportunities available to their brightest citizens, but wider issues such as political stability could also play a role. Moreover, policymakers could benefit greatly from access to more comprehensive data, which in turn would allow a more sophisticated understanding of the problem. These reservations notwithstanding, internationalization is continually believed to play a significant role in countering some of these problems. This, in turn is confirmed by recent experience from Indonesia, where the URGE initiative, which included a number of internationalization strategies, proved successful in retaining young graduates and strengthening the existing higher education system (see Annex 3).

Political Commitment

Within a framework of economic openness and competition the Colombian Constitution from 1991 guarantees the autonomy for higher education institutions, in the sense that they have the freedom to

135. Some systematic undercounting of immigrants with less educational attainment is inevitable in these data.

136. New York Times (April 10, 2001) cites sources that approximately 1.1m Colombians—mostly highly educated-have left the country in the last ten years. The article estimates that the Colombian-American community counts more than 430,000 emigrants and is rapidly growing.

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determine their internal norms, but paying respect to the ideological pluralism.[137] These new conditions served to expedite the *Ley 30 de Educación Superior* of 1992, becoming the legal framework that has supported the transformation processes that the Colombian system of higher education has gone through in the last 10 years. *Ley* 30 establishes internalization as one of the main challenges of higher education, and assigns the responsibility for this to ICFES. Of further importance for this study is Article 226 of the Constitution, which establishes the principle of promotion of the internalization of the political, economical, social, and ecological political relations on the foundation of equity, reciprocity, and national convenience.

The Social and Development Plans that have oriented the national politics since the beginning of the nineties have considered education as a central element in the development of the country. The Governmental Plan of President César Gaviria, the "Pacific Revolution," tried to adjust the conditions of the country to those of the world. It was therefore necessary to undertake strategies that could improve the human capital and the strengthening of the technological and scientific capacity. It was acknowledged that the creation and consolidation of international networks, participation in groups of excellence, the development of collaborative international research projects, and the opening of scientific cooperation and its international exposure all were essential tasks for Colombia's higher education sector to advance. Unfortunately, this ambitious Plan has been criticized by the way it was developed despite the need to start important reforms for the country.[138]

From 1994 to 1998, President Ernesto Samper established his Plan called the "*Salto Social.*" Employment and education were the focal points of this navigation map. Internationalization was obviously considered as crucial, in the sense that it could generate the bases for a more competitive and stable policy for science and technology. During this period the Colombian International Cooperation Agency was established to deal with the financing and the technical aspects of the international cooperation. Universities, as the plan proposed, needed to have excellent standards of quality if they wanted to compete and be part of the international academic community. Different circumstances that affected the national development made it impossible to fulfil what was set out in this ambitious Plan.

In the last four years, (from 1998 until 2002) under the presidency of Andrés Pastrana, education continues to be at the center of the Government's declared policy called "*Cambio para Construir la Paz.*" There should be a fundamental compromise of society with education, culture and the preparation for work-life if "we want to have less poverty and a better human and social capital," as it is defined in his Governmental Plan. Although the international policy expressed in this Plan, as a way to convert the country into an active participant of the global process, has been very important, they have not impacted the international dimension of the Colombian higher education. They have had a more political and economic characteristic, than cultural and educative. It is evident that the last decade and the beginning of this century show the need to make important efforts in order to transform the Colombian higher education system. Globalization has clearly imposed significant challenges to the higher education sector, which in turn forces the sector to engage in progressive processes of innovation if they want to improve their relative competitive-

137. The Constitution of 1991 considers education as the right that a person has and a public service with a social function: through it, the citizens can have access to knowledge, to science, to technology and to the cultural goods and values, as it appears in Article 67 of the *Magna Carta*. Article 27 also defines the freedom of teaching, learning and research. In fact, the right to education is so important for the development of a country, that it has deserved a special recognition, not only in the Constitution, but in international agreements like the Universal Declaration of Human Rights (Article 26), the American Declaration of Rights and Duties of Men (Art. XII), only to mention a few. Article 69 is important because it guarantees the autonomy for higher education institutions in the sense that they have the freedom to determine their internal norms, but paying respect to the ideological pluralism. It is therefore the obligation of the State to guarantee and assure the necessary conditions that a student needs in order to access and remain in the system.

138. Saavedra Guzmán, Ruth, Castro Zea, Luis, et. al. *Planificación del Desarrollo*. Bogotá: Universidad Jorge Tadeo Lozano. 2001. p 236

ness. However, the often-declared official policy of internationalization has not led to the development of a coherent action plan.

Even though a coherent policy framework is still to emerge, a number of positive measures have been taken after all. These in turn include the promotion of student exchanges, initiatives aimed at internationalizing students' curricula and efforts to set up international networks.

Student Exchange

The internationalization process in Colombia has paid considerable attention to student exchange programs. Financial support for these programs has been provided by the government and other institutions, and managed mainly through 3 domestic organizations: *Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior, ICETEX; Instituto Colombiano para el Desarrollo de la Ciencia y la Tecnología, COLCIENCIAS;* and *COLFUTURO.* Moreover, various bilateral agreements provide scholarships funded by foreign sources.

ICETEX

One of the most important governmental institution in charge of credit and scholarships is ICETEX created in 1957. The Institute selects the beneficiaries of international scholarships offered by other countries through international cooperation, exchange programs and other sources, and offered to Colombian students (Chapter I, *of Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior,* ICETEX, Art. 115, *Ley* 30). Although the amounts of loans for studying abroad have increased since 1995, they have not met the demand for these types of programs. The number of students benefiting grew from 498 in 1995 to 1002 in 2001, leaving more than 300 applications unattended in that year alone. The amount of student aids more than tripled in the same period of time. Hence, in 1995 it totaled Col. pesos 2,173,402, which had increased to Col. pesos 9,124,000 in 2001. The United States and Europe, particularly Spain seems to be the most attractive destinations abroad. In the year 2000 approximately 92 students choose some program in the United States, which represents 16.7% of the total for that year, while Europe attracted more than 50% with Spain being the country with the highest percentage, 39.9%. Latin America accounts for approximately the same percentage as North America with a total of 20% (see table V-1). The total number of students who obtained a loan to study abroad was 551. Most of them have been applied to Master programs, especially in the areas of Administration and Health.

COLCIENCIAS

Since its foundation COLCIENCIAS has been the lead organization in the promotion and the development of science and technology activities in the country. It is the only governmental organization not affiliated with the Ministry of Education, but to DNP which provides substantial resources to higher education. COLCIENCIAS offers scholarships to Colombian professionals who want to continue their masters or doctoral studies abroad. So far 1997 has been the year in which most students received support to continue their professional training: 151 students for doctoral programs and 42 for masters programs. These scholarships were part of a credit granted by the Interamerican Development Bank (BID). These numbers have subsequently dropped considerably. Hence, only six students received support for Ph.D. programs and two for Masters programs in 2000.

The cost of these programs was on average Col. pesos 145.6[139] million per student, which is significantly higher than the average cost of domestic post-graduate students at Col. pesos 9 million.[140] This raises the question of whether there is a more efficient allocation of these resources without sacrificing the international exposure needed for the Colombian National Innovation

139. Figure in 1999 constant pesos, calculated by authors.

140. IESALC-UNESCO. *La educación superior en Colombia.* Report, April 2002. unpublished. Citing: *Periódico Portafolio. "Universidad Pública: Hacia su sostenimiento."* Octubre 15 de 1998, estimates of *Ministerio de Hacienda.*

TABLE V-1: STUDENTS GOING ABROAD BY DESTINATION, ICETEX, 2000

Destination	Number of students	% of total students going abroad
Argentina	14	2.5%
Brazil	16	2.9%
Costa Rica	12	1.8%
Cuba	13	2.4%
Chile	10	1.8%
México	28	5.1%
Venezuela	9	1.6%
Other in LA	8	1.5%
Total Latin America	**110**	**20%**
Canada	20	3.6%
USA	92	16.7%
Total North America	**112**	**20.3%**
Spain	220	39.9%
France	34	6.2%
The Netherlands	10	1.8%
Great Britain	24	4.4%
Other Europe	24	4.4%
Total Europe	**312**	**56.6%**
Total	**551**	**100%**

Source: ICETEX

System (NIS). The idea of introducing visiting periods and "sandwich" programs (a period abroad in between domestic studies) could be an option.[141]

COLFUTURO

COLFUTURO, a non-profit institution, also offers financial aid for students who want to pursue either a graduate degree abroad or Colombians wanting to improve their English skills. It is a joint effort of private firms, public firms and some higher education institutions, which has also established bilateral arrangements with the Institute for Housing and Urban Development (Netherlands), the British Council, University of Alberta (Canada), and the University of Amsterdam. Depending on the credit-scholarship program, *COLFUTURO* cancels a percentage of the outstanding debt if the graduate returns to Colombia, and the percentage also depends on the type of study undertaken abroad (*COLFUTURO* organization, 2002). From 1992 to 2001, it has financed 873 students, 80.7% studied masters programs, 13.5% doctorate programs and 5.8% specialization programs (IESALC-UNESCO, 2002).

Bilateral Programs

The Fullbright Commission of the United States has supported a significant number of Colombians (2,800) with total or partial scholarships to pursue postgraduate study programs in the United States. A much smaller number of Americans (approximately 800) have come to the country, as visiting professors or students. During its 45 years of existence, the Commission has received some US$42 million from the US Government, and US$5 million from the Colombian government. The specific demand for studies abroad has changed academic profile over time. Traditionally it was Social Sciences

141. See *Reforming Student Financial Aid in Colombia: Issues and Alternatives* by Arthur Hauptman

and Humanities. During the nineties, Engineering and Environmental Sciences have been the most solicited followed by Financing, Political Science, Humanities and Basic Sciences.

Bilateral programs financed by the British Council, *Aliance Française*, DAAD (Germany) and the Spanish Agency for International Cooperation have also provided opportunities for young Colombians to study abroad.[142] In the year 2000 these three organizations financed 185 students to go abroad, which represents an international exposure of less than 1% of the students who graduated in 1999.[143]

Curricula Activities

In response to the Strategic Export Plan of 1999–2009, several initiatives have been launched to internationalize the curricula of higher education programs in Colombia. In this respect, the "*Cátedra de Negocios Internacionales*" has been made available, with support of the Ministry of Education, to students in professional, technological and technical programs. The program draws extensively on international elements and experiences, with a view to strengthen the export culture in the country.

Since the establishment of Colombian higher education in international markets has become so central to the current Government, the Chamber of Commerce of Bogotá has, in collaboration with the universities in Bogotá, developed an Export Plan for higher education services. The plan enjoys strong support from the Major's office and *Proexport*, the Colombian trade promotion department. The Chamber expects to consolidate this plan during the year 2002.

In the same direction the government (ICFES through its program *Diplomacia Educativa*) shows the general interest on the internationalization process that higher education institutions have started with the idea of strengthening the academic international cooperation with institutions of higher education of neighbouring countries like Venezuela, Panama, Ecuador in the Andean Region; Guatemala, Honduras and Nicaragua in Central America and some others in the Caribbean region. The participant higher educations institutions come from all the regions of the country which have been present in international events and academic missions in order to exchange experiences and promote the Colombian higher education institution's services and programs. Its main objective is "to positioned Colombian higher education within the Diplomatic and Academic Community, national and internationally, in order to facilitate the international process. This process should improve not only the student exchange intended to improve the quality of education, but also to strengthen the international relations of our country and to generate more financial resources for the country through the academic operation."[144]

International Networks and Research Collaboration

The rationale behind the establishment of international networks is to foster the exchange of ideas between higher education systems through visiting scholar programs and, related to that, promote joint research activities. The recently established European Research Area (ERA) provides a good example of regional cooperation (Box V-1). Therefore, the ERA experience draws attention to the fact that the pooling of collaborative funds in areas of common interest greatly increases the perspectives for carrying out excellent research. Drawing a parallel to Latin America, the European example makes a case for strengthening research collaboration in the Latin American region. Still, it should be noted that the ERA has benefited from a highly developed European policy, something that does not yet exist in Latin America.

The Colombian Network for International Cooperation (RCI) is the most comprehensive effort undertaken in Colombia. In addition, other network programs have been initiated with

142. More recently, the European Union has also undertaken other initiatives to support student exchange programs in Colombia.

143. 0.17% if we considered 185 students over the class of tertiary education for 1999, 106,755 graduates. Source: ICFES Estadísticas de la Educación Superior 1999.

144. participating programs have been certified by the National Council of Accreditation, CNA

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BOX V-1: EUROPEAN RESEARCH AREA (ERA)

The European Union (EU) has long recognized the critical role that research, innovation, knowledge and human capital. Hence, the desire to improve R&D efforts led the European Council to formally launch the European Research Area (ERA) at the Lisbon Summit in June, 2000.

The ERA is based on principles of cooperation across countries, to work in a cohesive manner within the union countries. At the same time, it recognizes country identities, national priorities and launches complementary projects. Priority is given to research projects assumed to be beneficial to all countries. Moreover, the target projects are large-scale projects, above and beyond the possibilities of a single country.

ERA also considers building networks of excellence, through the adoption of joint programs and staff exchanging. It also encloses activities aimed at applying innovation by providing funding and connections between financing entities and universities for the development of incubators for technology companies. Infrastructure and human resources continuous improvement is considered key. Society involvement is another important element, realized through the public dissemination of findings and initiatives to promote public's knowledge of science and technology. Moreover, the relationship between society and science is represented in the creation of an European scientific reference system that provides principles for sustainable development. ERA, even when based on previous experience of building "clusters" and networking, is more that an extrapolation of previous programs. It can be understood as the European joint effort to build centers of world class research, linking them trough a network of excellence, and most importantly, sharing an integrated research program based on their individual national programs.

Source: European Commission, 2000

the support of foreign countries, notably the COLUMBUS and ALFA launched by the European Union.

Colombian Network for International Cooperation, RCI

In 1994 a forum convened by ICETEX proposed to create an institutional network for the Colombian international relations offices. The network was designed to consolidate, not substitute, the ongoing internationalization activities of the individual universities. This network, with more than 100 members representing all the regions of the country, is a non-governmental, non-profit organization, which includes most of the International Relations Offices of higher education institutions in the nation. RCI which is coordinated by the Association of Colombian Universities, ASCUN was created in order to stimulate, promote and strengthen the culture of international cooperation within Colombian universities. It equally serves as the focal point for cooperation with other similar international networks worldwide. Furthermore, RCI is supported by ICFES and ICETEX. It is open network and program activities are funded through grants from its parent organizations like ASCUN, ICFES or ICETEX.

Four main lines of work characterize RCI:

i. Formation and Training in International Management. In relation to formation and training in international management, RCI has maintained a continuous educational program since its creation through workshops, general meetings, congresses, and seminars to assist institutions in their internationalization efforts. In the year 2000 with the support of ICFES, it conducted an itinerary program, with the participation of most of the Directors of International Offices of higher education institutions. Unfortunately, financial provisions for this type of programs are not available for the time being.

ii. Information and Publication of Cooperation Opportunities. The Network has published several manuals, which have been the only reference in Colombia for information about student

opportunities abroad, scholarships, credits etc. Likewise, members of the Network have published "The Guide for International Students." This is the product of a thorough investigation of the most relevant aspects relevant to any international student who wishes to come to Colombia to study in any of the higher education institutions located in the capital, Bogotá. The publication in English has received the support of the Chamber of Commerce of Bogotá and will be delivered to the most important national and international organizations involved with higher education.

The information activities are also supported by a web-page designed to keep all its members informed of the latest information related to internationalization and international cooperation.

iii. Academic Mobility. The program Intercambio Académico, Técnico y Científico—RCI has been designed to offer opportunities of international exchange to the academic community in general. It was conceived for pre- and postgraduate students, teachers, researchers and administrative staff and provides for different modalities: Short stays (minimum 8 weeks), semesters abroad and postgraduate programs. The program, which was created by the Asociación de Universidades de América Latina y el Caribe para la Integración, AUALCPI,[145] transferred the coordination of the program to the Colombian International Network which has made a great effort to implement it in several countries. Still the sustainability of the program is threatened due to lack of financial resources. During the year 2000, Colombian higher education institutions received around 30 Brazilian students, professors and researchers. In the year 2001, by contrast, only 3 students from Mexico and Brazil participated in this program.

iv. Promotion and Exportation of Colombian Higher Education. Along with the initiatives generated by the Government, RCI has worked permanently on how to work closely and in cooperation with other institutions and organizations of the region, particularly with Central America, the Caribbean and the Andean Region. This work has had the support and the cooperation of different Governmental organizations along with the Chamber of Commerce, which has identified Bogotá as the pilot project in order to gain some experience and then extend it to the rest of the country.

Although the network has gained nationwide recognition, significant barriers exist. The difficult situation that the country is going through does not permit a sustained exchange program. The image of Colombia abroad and the economic recession have a dramatic impact on international collaboration and consequently on higher education institutions. Other barriers to international collaboration include the existence of restrictive emigration politics, inflexible legal norms, rigid curricula and lack of financial support.

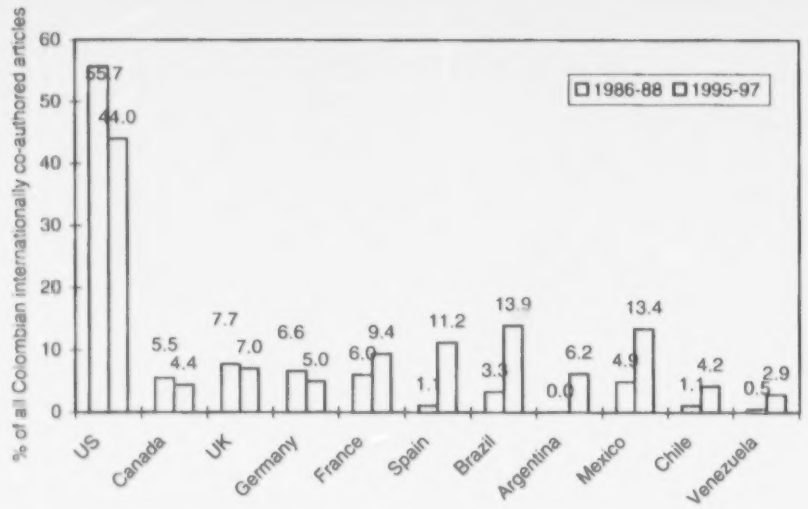
Foreign Networks: COLUMBUS and ALFA

Some institutions have build links with international programs, such as *COLUMBUS*, an initiative supported by the European Commission. The program is designed to establish links between European and Latin American higher education institutions. The stated objective of the program is to promote "the clustering of universities around specific themes with the aim of promoting institutional development and multilateral cooperation" (*COLUMBUS*, 2002). It has 10 Colombian member institutions: Universidad del Norte, Colegio Mayor de Nuestra Señora del Rosario, Escuela de Ingeniería de Antioquia, Universidad de Antioquia, Universidad Católica de Colombia, Universidad de la Salle, Universidad Externado de Colombia, Universidad Nacional de Colombia, Universidad Pedagógica Nacional, Pontificia Universidad Javeriana. So far the program has facilitated evaluation projects and seminars in Colombia, yet there are none currently in process.

ALFA is a European Commission initiative, which includes two sub-programmes, one on joint projects in institutional management and a second seeking to support scientific and technical training. The objectives include the strengthening of links between the academic communities of Europe and

145. AUALCPI is a collaborative network with 27 universities from Argentina, Brazil, Chile, Colombia, El Salvador, Guatemala, México, Nicaragua, Paraguay, Perú, Uruguay and Venezuela.

FIGURE V-1: COLOMBIA CO-AUTHORSHIP PATTERNS



Source: NSF Science & Engineering Indicators 2000.

Latin America, and the creation of sustainable mechanisms of cooperation and mobility between the two continents. ALFA tries to maintain a geographic balance of participation, allowing for less develop institutions to be eligible. Colombia is currently participating with 5 institutions.

It is difficult to assess the degree to which networking schemes have been successful. Yet, the level of coauthored articles as seen in Figure V-1 can be used as a proxy for the level of international integration in the higher education sector.[146]

In the period 1986–1988, Colombia shared 55.7% of its joint publications with the United States, a figure that has subsequently been reduced to 44% in 1995–1997 in spite of recent internationalization efforts. At the same time, its collaboration with Spain rose from 1.1% to 11.2%, with France from 6% to 9.4% It should be better stated.[147]

A great potential for Latin American cooperation exists due to shared language, common historical background and geographical proximity.[148] Accordingly, patterns of collaboration have been strengthened over the last decades (see Annex IV). Yet, compared to the European Union, the level of Colombia-Latin American joint publications continuously lag behind (2).[149] Still, the increase in regional co-publications is a promising sign, which suggests that past networking efforts may have

146. Still, the level of collaboration is influenced by numerous factors, Accordingly, a recent RAND study (2000) stressed the following issues: geographic proximity, historical relationships, common language, common scientific problems (as a natural disasters) and economic factors, that may provide more funding to certain scientific fields.

147. While sharing its internationally coauthored articles with around 30 countries (1995–1997) this figure is still small considering that the highest, the United States, shares more than 1% of its coauthored papers with at least 160 countries, and China (the 75 percentile) shares it with around 70 countries. (RAND 2000).

148. When referring to Latin America, this section just considers Brazil, Argentina, Mexico, Chile and Venezuela due data availability.

149. This averages includes the co-authorship percentages of 14 out of the 15 countries. The percentages widely differ, when United Kingdom, France, and Germany present a two digit number, countries as Portugal have a less than 1 percentage number.

had some impact. This in turn makes a case for strengthening regional networks even further and possibly aim at establishing a regional research area along the lines of ERA (see above).

Conclusions

Globalization has posed serious challenges to the higher education sector in Colombia. Hence, internationalization efforts, which go beyond the current scope of activities, are warranted.

First of all, the government needs to move beyond the level of declarations, and translate its commitment into a coherent and targeted policy program. The commitment should stem not only from the government, but also from higher education institutions and the academia itself. The current Governments participation, related to legislation, regulations and funding, could be transformed into an integrating and facilitating role, based on close consultation with higher education institutions.

The Governments must establish adequate foreign policy, immigration, and labor movement regulations in order to respond to the new challenges imposed on Colombian higher education institutions. It should eliminate the barriers that obstruct the internationalization process, if it is committed to offer a modern education. The term internationalization should be adopted in the agenda of higher education for future years given the implications it has for Colombia's ability to compete in an open global market.

Further, it is necessary to regularly collect and analyze data about internalization, in order to monitor this activity and provide information to strengthen this process. Governmental organisms like ICFES, along with private associations like ASCUN, should keep track of the advancements and trends and collectively provide strategic directions for the higher education system.

Higher education institutions should define an international policy and subsequently international strategies to direct its development and its implementation. For example the international dimension could be added to all existing programs allowing the institution to graduate professionals with global competencies, with language and information skills and with a better understanding of the cultural differences.

With regard to the specific policy instruments at hand, a special case is made for strengthening current networking efforts. Hence, the setting up of networks has proven to be a less costly alternative than student exchange programs, which have proven extremely costly. Thus, inspired by a recent surge in the level of joint publications and the experience of other regions, EU is a case in point, it is suggested to continue along these lines. Even though the Latin American region does not benefit from a institutional set up similar to that of the European Union, a common historical background and a similar economic situation, where no country can develop multiple world class research centers in isolation makes a strong case for integration. In consequence, it is hoped that a successful integration scheme could lift the quality of higher education throughout the region, which in turn would make it more attractive for Colombians to study and work in Colombia, rather than in Europe or the US.

Student exchange programs, on the other hand are not only costly, but it should also be pointed out that these programs fuel the current level of brain drain to some extent. Thus, a review of the program design is recommended, keeping in mind that the objective is to develop human capital for the country's teaching, research and innovation activities. This comprehensive effort requires financial support to guarantee sustainability over time. Nevertheless it is of fundamental importance to provide sustained political and financial support to academic mobility programs which continues to be at the core of the internationalization process. Efforts should be made from the public and the private sector to provide grants per participant. This would reduce the financial burden that higher education institutions, students and families have to bear, reducing the opportunities of those who wish to be part of these kinds of programs.

Finally, further support should be channeled towards programs designed to internationalize curriculum. The results of *Cátedra de Negocios Internacionales* project have yet to emerge, but it remains without doubt that such efforts give students both the cognitive skills and the intercultural understanding necessary to perform in the current economy.

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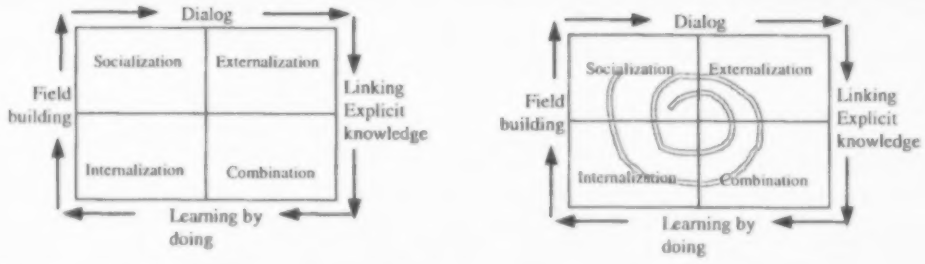
Annex V.A: The Knowledge Spiral

Nonaka *et al.* (1998) offer a view on how the transfer of knowledge is done based on human interaction. They divide knowledge in two categories: tacit and explicit. These are mutually complementary, but only the later can be formally measured. Tacit knowledge is thought of as individual specific knowledge that can be shared through interaction. Nonaka et al, presents four modes of knowledge transmission:

- Socialization: from individual tacit knowledge to group tacit knowledge.
- Externalisation: From tacit knowledge to explicit knowledge.
- Combination: from separate explicit knowledge to systematic explicit knowledge.
- Internalisation: from explicit knowledge to tacit knowledge.

These nodes serve as background for the knowledge spiral, that often starts with *socialization* where dialogue makes the knowledge be *externalised*, then, by linking explicit knowledge, one gets into *combination*. Learning by doing then converts combination into *internalisation*, where field building converts into *socialization*. When the process integrates outsiders (e.g. researchers, foreign employees, etc.), it is assumed that the organization (e.g. research centre, university, firm, etc.), can integrate their external knowledge in combination and thus, get a enrich spiral.

FIGURE 1. NONAKA ET AL'S KNOWLEDGE SPIRAL
[CITING NONAKA ET AL (1998) OWN DRAWING]



Source: Langberg and Ebbe K. Graversen. Mobility among researchers. Analyseinstitut for Forskning.

Annex V.B: Brain Drain

BRAIN DRAIN STATISTICS BY COUNTRY AND EMIGRATION/IMMIGRATION FLOWS

Country (ies)/ Geographic Area of Origin	Emigrants living in US (1990)	Emigrants in the US with Tertiary Education	Tertiary Emigrants/ Total Emigrants	Country	Percentage of Population with Tertiary Education who Emigrate
México	2,700,000	351,000	13%	*Jamaica*	*77%*
Philippines	730,000		+50%	*Guyana*	*70%*
China	400,000	200,000	50%	*Ghana*	*26%*
India	300,000+	225,000+	75%	*Iran*	*25%**
Korea	300,000+	159,000+	53%	*Philippines*	*10%**

(continued)

BRAIN DRAIN STATISTICS BY COUNTRY AND EMIGRATION/IMMIGRATION FLOWS (*Continued*)

Country (ies)/ Geographic Area of Origin	Emigrants living in US (1990)	Emigrants in the US with Tertiary Education	Tertiary Emigrants/ Total Emigrants	Country	Percentage of Population with Tertiary Education who Emigrate
Africa	128,000	95,000	75%	*Korea*	*15%**
Jamaica			42%	*Pakistan*	*7%**
Trinidad/Tobago			46%	*Egypt*	*7%**
South America			Roughly 50%	*India*	*2.7%**

(*Includes only immigrants to OECD countries; actual total are likely higher)

Source: Carrington and Detragiache (1999)

Annex V.C: Indonesia: the University Research for Graduate Education Project

In 1994 the Indonesian government initiated the University Research for Graduate Education Project (URGE), to give greater financial autonomy to public institutions, while making the allocation of resources more efficient and improving the quality of graduate education in the system. The URGE project, assisted by the World Bank from 1994 to 2001, addressed the issue in a comprehensive manner. It aimed at raising the higher education system to world participation standards. The particular objectives established were to (a) increase competitive funding for domestic graduate education and university research activities, (b) to strengthen the procedures for selecting grant and fellowship proposals, (c) to integrate university research with graduate training, (d) to strengthen research capacity and dissemination of research findings in universities and (e) attract highly qualified candidates for domestic graduate education.

URGE contemplated increasing the institutional capacity of the University Research Council (URC) and assisting it in the implementation of new procedures for allocation of grants and fellowships. The URC adopted a new paradigm that stressed the objectives of equity, relevance and quality of projects founded, while promoting the autonomy of institutions.

A second component was making resources available through grants and fellowships in a competitive manner, addressing different needs of the system, from the formation of graduates to the growth of the national research network. Competition was used to raise research levels.

Grants were awarded to research centers on the basis of accomplishments. Funds were also awarded to Research Teams that integrated both students and faculty in research activities and young academics. Among the merits of the program, it should be highlighted that the share of female participation in research activities increased significantly.

In order to increase the pool of graduates, researchers and academics, two additional grant programs were designed: (i) The Merit Fellowship program designed to attract highly qualified and capable students into domestic graduate programs; (ii) the pre-graduate program to give individuals the opportunity to participate in top-level universities graduate programs. After completion they returned to their home institutions to disseminate their acquired knowledge. One of the grant requirements that helped retain researchers was that the topic had to be relevant to Indonesia. Accordingly, the best available resources were to be found within Indonesia, in terms of fellow researchers working on the same issue or libraries and information.

Source: World Bank. University Research for Graduate Education (URGE). Implementation Completion Report. Internal document (2001).

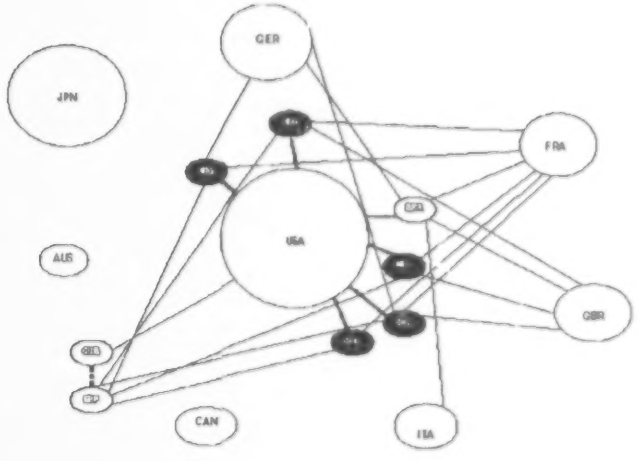
The domestic collaborative research grant helped to establish links between senior researchers with wide expertise and grantees. The grantee would visit a Research Center or University benefiting from the equipment and the interaction with a large and active team.

Finally, URGE exposed scholars to international environments through the provision of means to travel abroad, international seminars and conferences.

This program proved successful not just in retaining and motivating researchers, but it also helped to establish a new paradigm in competitive research allocation and provided more autonomy to institutions. Furthermore, the connections and collaborative pattern introduced through the URGE program have consolidated and continue to be in practice in the Indonesian research system.

Annex V.D: Patterns of Academic Collaboration

FIGURE V-2: PATTERNS OF CO-AUTHORSHIP, USA/LATIN AMERICA AND EUROPA



8% -
30% -
50% -
Over

Scientifically advanced
Scientifically proficient
Scientifically developing
Scientifically lagging

ARG=Argentina, AUS=Australia, BRA=Brazil, CAN=Canada, CHL=Chile, COL=Colombia, CUB=Cuba, FRA=France, GER=Germany, ITA=Italy, JPN=Japan, Mex=Mexico, ESP=Spain, GBR=United Kingdom, USA=United States , VEN=Venezuela.
Source: NSF Science & Engineering Indicators 2000.

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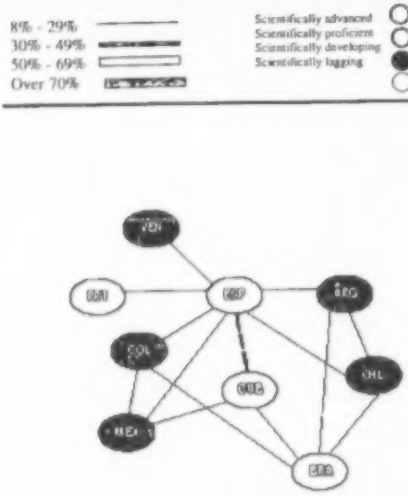
FIGURE V-3: PATTERNS OF CO-AUTHORSHIP BETWEEN PROFICIENT, DEVELOPING, AND LAGGING COUNTRIES.



Source: RAND (2000

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Annex VI

Economic Perspectives of Tertiary Education

Prepared by Andreas Blom and Thomas Hansen

Introduction

Colombia has, along with many other developing countries, witnessed a major expansion in the education system. Simultaneously, structural economic reforms have swept the country's economy that now stands more liberalized, internally and externally. The combined forces of the ever expanding technological frontier and the continued global integration of national markets reinforce the value of skilled labor in both developed and developing countries. This paper investigates two questions associated with this development; (i) To what extent did the worldwide trend of increased demand for highly skilled labor reach Colombia, and (ii) did the tertiary education system adapt to the increase in demand?

The study joins a strand of literature focusing on the changes of labor demand associated with market liberalization and increased integration of developing countries into the global economy. The literature documents an increased convexity of the earnings function. That is, the return to one additional year of schooling rises with the years of completed schooling. Or, in other words, a skilled worker earns increasingly more than an unskilled worker.[150]

The empirical findings on increased rewards of skills are theoretically underpinned by Feenstra and Hanson (1996) and Wood (2000). They argue that the economic reforms in developing countries combined with decreasing transportation and communication costs give developing countries a comparative advantage in industries with an increasing intensity in human capital, although still low intensity relative to developed countries. The move of these industries to reforming developing countries have caused the average input of human capital in production, in both developing and developed countries to increase. Consequently, both groups of countries have experienced an increased demand for skilled workers. Findings from Costa Rica, Robbins and Gindling (1999), and Columbia, Santamaria (2000), show that Latin American countries, indeed, have experienced a shift in labor demand favoring highly skilled workers.

150. See Katz and Murphy (1992), Murphy, Riddle, and Romer (1998), Robbins and Gindling (1999), Santamaria (2000), World Bank (1999a), Lächler (1998), and Schady (2000) among others.

The changed remuneration of education on the labor market is important, since it indicates that highly skilled workers have become increasingly scarce in the Colombian labor market. A scarcity would impede domestic companies and administration in acquiring the demanded advanced knowledge and therefore hinders economic growth.

If the market for education functions smoothly, the supply of education would adapt to the shifts in demand. However, the market for education is restricted in many countries, see Prichett (2000). By analyzing the market for higher education in Colombia, the investigation seeks to identify the main constraints of the education sector. The increased demand for workers with tertiary education might, therefore, not be accommodated by changes in supply, in which case policy intervention is warranted.

The paper is organized as follows: the subsequent section describes the data and overall developments in educational attainment of the labor force. Section three looks into the labor market value of different kinds of education and their development over time, and the subsequent section offers a number of explanations as to why changes in remuneration have come about. Section five discusses recent trends in unemployment and explores why the level of unemployment among highly skilled people is high in spite of increasing rewards. Section 6 changes the locus of analysis from the labor market to the market for higher education and examines the evolution of supply and demand of seats in higher education. The final section summarizes the findings and sets forth a number of policy recommendations.

Account of 70 Years of Educational Attainment in Colombia

This section explores national household data set in order to describe the evolution of educational attainment in Colombia from 1930 to the end of the millennium. The Colombian national household dataset, Encuesta de Hogares, serves as the primary source of data. The national statistical office, DANE, surveys families residing in urban areas on a quarterly basis. The analysis starts in 1980 and ends in 2000 and builds upon the yearly September version of the quarterly survey.

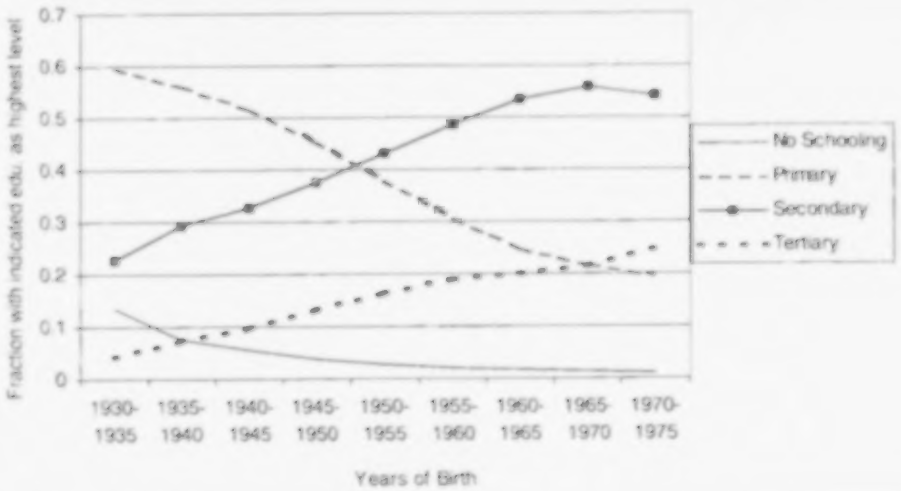
Figure VI-1 describes the educational attainment of each 5-year birth cohort from 1930 to 1975. The figure shows that secondary and tertiary attainment increased significantly throughout the period. This implies that the proportion of workers without education and with primary school as highest level decreased correspondingly. Hence the educational attainment improved with the advent of every new cohort. For the cohort born during the depression years, 1930–1935, 14 percent received no schooling at all, while around 6 out of 10 reached primary only. Almost half a century later, the education system had improved significantly and provided more than 80 percent of the generation born in the early 1970s with secondary schooling and only 1 urban child out of 100 was left without formal classes. This contributed to improve basic literacy, among the highest in Latin America at over 90%.

For the further analysis, two aspects should be noted. First, gains in educational attainment have not come steadily overtime. Accumulation of human capital accelerates in certain periods and stagnates in others. Generally, the pace of the educational gains slowed down over the century (Table VI-1). Especially the birth cohort born 1965–1970 acquired only marginally more education than the previous cohort, which points to an unsatisfactory performance of the education system in the late 1970s and early 1980s. The subsequent cohort acquired slightly more human capital, 0.39 years of schooling additionally, which presumably will increase, since a fraction of the cohort might still linger on in tertiary education system.[151] The variation demonstrates that education policies and time-specific circumstances matter greatly.[152]

151. With regard to the performance of the education system for the period after the mid 1980s, enrolment ratios are more appropriate than attained education, since the majority of these birth cohorts still attend schooling and hence continues to increase attainment of schooling.

152. The recent severe economic recession in Colombia is a clear and unfortunate example of how economic hardships can decrease schooling enrolment. Enrolment in tertiary education declined by more than 15 percent in 1998. Falling enrollment rates could also be noted for the younger age groups (7–11 and 12–17 years respectively), but these falls were marginal compared to drop in enrolment rates in university. Schady (2001) shows that in Peru a severe economic recession actually led to increased enrollment in to primary education, because of wage-remunerated alternatives were not available to children.

FIGURE VI-1: SIGNIFICANT IMPROVEMENTS IN HUMAN CAPITAL OVER THE LAST 70 YEARS
(Educational Attainment by Year of Birth, Urban areas only)



Source: Angel-Urdinola (2001) based on Encuesta de Hogares 1982–2000
Note: Attended (and not completed) education cycles.

TABLE VI-1: SLOW DOWN IN SCHOOLING AND THE RELATIVE RISE OF HIGHLY SKILLED LABOR
(Attained education by birth cohort 1930–1975)

Cohort (born between)	Years of schooling	Growth in Years of schooling (in years)	Growth in Years of schooling (in %)	Absolute difference Secondary to Tertiary* (Difference in share of labor force in % points)	Relative ratio of attained Secondary to Tertiary** (Relative size: Tertiary/ Secondary)
1930–1935	5.02	—	—	18.3%p	19.0%
1935–1940	5.91	0.91	18.1%	22.3%p	24.1%
1940–1945	6.48	0.57	9.6%	23.0%p	29.7%
1945–1950	7.21	0.72	11.2%	24.4%p	34.9%
1950–1955	7.89	0.68	9.5%	27.0%p	37.6%
1955–1960	8.53	0.64	8.1%	29.9%p	38.6%
1960–1965	9.02	0.49	5.7%	33.5%p	37.3%
1965–1970	9.31	0.29	3.3%	34.4%p	38.2%
1970–1975	9.70	0.39	4.2%	29.5%p	45.6%

Source: Angel-Urdinola (2001) based on Encuesta de Hogares 1982–2000
Note: *Difference in share between secondary and tertiary equals the share of the cohort with secondary deducted the share with tertiary education. **For the relative ratio, the two shares are divided.

Second, it should be noted that the increase in educational attainment is particularly pronounced for secondary schooling. Roughly one in every five born during 1930–1935 reached secondary level. This increased to more than one in two for the 1970–1975 cohort. Although, universities attracted a growing number of secondary graduates, the tertiary education system did not match the massification process undertaken by the secondary system. As a consequence, the difference between the share of workers with secondary schooling and tertiary education expanded from around 20 percent for the interwar generations to around 30 percent for the youth born after 1960. However, the ratio of medium skilled to high skilled increased during the half century. For the pre-WWII cohorts only 1 in 5 secondary graduates reached university, while close to every second continued for the 1970s cohort. The relative supply of highly skilled workers hence increased gradually and in particularly for the 1970–1975 cohort (Table VI-1)

High and Rising Rewards for Tertiary Education

This section investigates the reward of education in general and the value of higher education in particular.

The paper only focuses on pecuniary rewards of education and hence does not target the question of quality in education explicitly. For references on the quality of education see World Bank (1998), which documents that quality, is a problem at all levels of education in Colombia contributing to poor achievement and persistently high repetition rates and dropout rates. Country Commercial Guide also reports that a mismatch between the skills of the workforce and the demands of the economy is the prime forces behind the high unemployment rate (1999). The quality of education in Colombia was also assessed in the 1996 cross-country study of educational achievement (TIMSS). The study didn't target tertiary education, but assessments of mathematics and science skills at the level of 8th grade showed that Colombia was seriously backtracked by most other countries included in the sample (predominantly OECD countries) (World Bank, 1999b). With regard quality in tertiary education, a number of surveys have assessed the Colombian education sector to be on average in a Latin American context, but insufficient compared to most industrialized countries (WEF, 2000; IMD 2001).

Formal schooling is the essential building block of human capital, and is the most influential determinant of labor market income. Table VI-2 shows the wage as of September 2000 by education level. It demonstrates a robust link between education and earnings. High pecuniary rewards await those acquiring tertiary education: the typical worker with a tertiary education earns Col $886,000 per month, the equivalent of US$ 403, which is 275 percent more than the average worker and over 6.5 times the wage of a worker with no education.

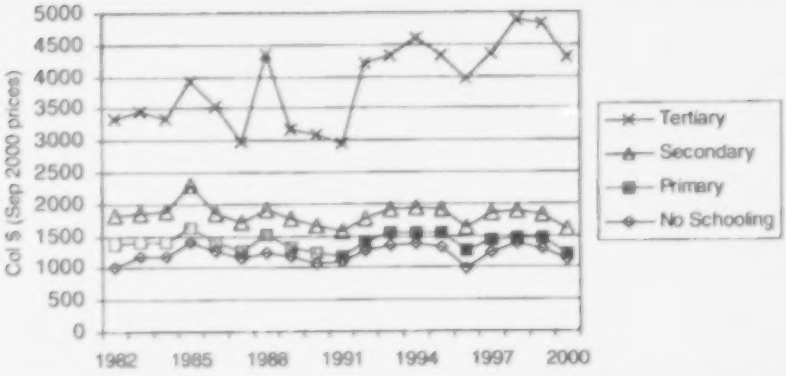
How and when did the wage-dispersion grow this large? Figure VI-2 shows that the dispersion in wages widened considerably during the 1990s. Thus, tertiary graduates experienced a 28% increase in real wage in the period 1982–2000. By contrast, workers with primary and secondary schooling

TABLE VI-2: LARGE DIFFERENCES IN EARNINGS DUE TO EDUCATION
(Earnings by Level of Education 2000)

Education level	Wage (Monthly) ('000 Col $)	Wage (Monthly) (USD$)	Wage in percent of average
No schooling	137	62.4	42.6%
Primary	208	94.7	64.6%
Secondary	278	126.2	86.1%
Tertiary	886	402.7	274.5%
Total workforce	323	146.7	100.0%

Source: ENH 2000

FIGURE VI-2: RISING WAGES TO WORKERS WITH TERTIARY EDUCATION
(Real hourly wage per education group 1982–2000)



Source: Angel-Urdinola (2001) based on Encuesta de Hogares 1982–2000
Note: Labor market earnings for full time employees aged between 25 and 65 years old

as the highest level experienced a 11–12% decrease in real wages in the corresponding period, whereas workers without schooling registered a 10% increase.

However, the level of salary often depends on a series of individual characteristics and context-specific circumstances. For example younger workers might be more educated, but earns less due to lack of experience. Hence, the difference in observed wages would underestimate the value of education if the difference in experience is not taken into account. Calculation of rates of return to schooling provides a widely used method to separate the impact of co-varying effects, such as experience from the impact of education on wages.

For that purpose an economic model has been constructed. The model follows Mincer's (1974) human capital earnings function extended to control for a number of other variables that relate to location of living and labor market status. In particular, we apply a semilogarithmic framework that has the form:

$$\ln yi = \varphi(si, xi) + ui \qquad (1)$$

where ln yi is the log of labor market earnings for an individual, i; si stands for completed years of schooling, xi is a matrix of personal characteristics other than schooling, namely, age, age squared, gender, and, labor market status.[153] The last component, ui, is a random disturbance term that captures unobserved characteristics.

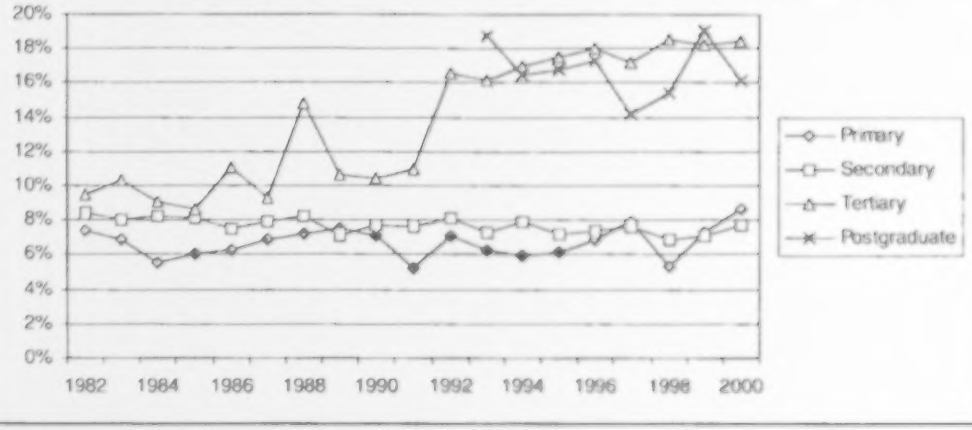
The functional form is left unspecified in equation (1). Thus, we estimate a spline form of years of schooling to estimate the average returns to one additional year of schooling regardless of the level of education.[154]

$$\ln yi = \beta o + \beta pri\ spri + \beta sec\ Ssec + \beta ter\ ster + \beta post\ spost + xi'\beta + zi'\beta z + ui \qquad (2)$$

where each s refers to the number of years of schooling completed at the level of primary (1–5 years of schooling), secondary (6–11 years of schooling), tertiary (12–16 years of schooling) and post-graduate schooling (17+ years of schooling).

153. Labor market status is either employee, self-employed, or employer.
154. See Green (1990) for more on spline-models.

FIGURE VI-3. PRIVATE RETURNS TO SCHOOLING BY LEVEL



Source: Own estimates based on DANE.

Note: Data for postgraduate level 1982–1992 omitted due to low precision at estimate (statistically insignificant).

Figure IV-3 presents estimates of private returns to schooling based on the specified model.[155] Caution should be applied when interpreting returns to schooling in a traditional investment way as the rates cannot entirely be interpreted as a causal effect from education to wages.[156]

The trend presented in the figure is clear. Thus, whereas the payoff from an extra year of education was largely independent of educational level in the early 1980s, the returns of tertiary and postgraduate education have increased significantly throughout the 1980s and 1990s. Returns to education in 1982 were for all levels around 8–9 percent. For tertiary education, the return increased markedly over the following two decades. In 2000, the rate of return was the doubled, 18.1 percent. In contrast, the return from an extra year of primary and secondary education has stagnated. In technical terms, a so-called convexification of the human capital earnings function has occurred.[157] The statistical reliability of these estimates is high for primary, secondary and tertiary, where t-values for all estimates are higher then 8. See appendix for specific values. For returns to post-graduate education only estimates after 1993 are statistical significant. For this level, the return seems to be equal to that for tertiary education, 16–18 percent.

Hence, there exists compelling evidence that returns from investment in tertiary education in Colombia is high and growing. Although, the growing wage-premium fuels wage-inequality, stakeholders and policymakers should keep in mind that the rising payoff stems from increased productivity and better allocation of highly skilled labor. Hence, policy initiatives and technological progress have increased the productivity and value of the highly skilled segment of the population. This situation provides decision makers with an opportunity to support economic progress and raise living standards by expanding the supply of advanced human capital.

155. The results have been obtained by using the Ordinary Least Squares (OLS) estimation technique.

156. The private marginal returns to schooling indicate the average wage difference between two workers with a one-year schooling difference. Due to the impossibility of controlling for individual academic and productive capabilities, the rate of return should not be interpreted entirely as a causal effect from education to wage. That is, private returns to tertiary education do not necessarily imply that any graduate from secondary education can increase his or her wage by the observed rate of return.

157. See also World Bank (2001a, p.59). In agreement herewith tertiary education (and postgraduate, by implication) can be viewed as an effective shield against poverty, whereas the protective effect of secondary education has fallen in recent years (World Bank, 2001, p. 65).

Reasons for the High and Rising Skill-Premium

The steadily growing difference between the falling wages of workers with medium level of education and the paychecks of highly educated workers could be due to numerous structural mechanisms. The literature suggests six such mechanisms. The essence of each hypothesis and the relevance in the Colombian case are discussed.

- *Institutional change in the labor market.* This explanation asserts that deregulation of the labor market, such as diminished labor union power, has reduced real minimum wages.[158] Currently, only 7% of the Colombian work force are organized into unions, which documents the relative weakness of union power. Accordingly, the minimum wage (real terms) was by the year 2000 only 97.3% of the 1990 level.[159] Hence, the real minimum wage decreased marginally in real terms over the 1990s, but this modest fall combined with the fact that returns to schooling at primary was unchanged indicates that the minimum wage cannot be behind the observed changes in returns to schooling.

The remaining five hypotheses are presented within a supply and demand framework for skilled versus unskilled labor.

- *Shifts in labor supply due to changes in the education system.* Assuming labor, skilled as well as unskilled, is a normal good, an increase in supply of one of the types of labor, would, all other things equal, cause the wage to fall. As presented above, several shifts in supply have taken place during 1980s and 1990s. One of the most significant changes has been a significant absolute increase in the supply of semi-skilled workers (workers with secondary education). See Santamaria (2001) finds the supply to be an important factor behind the increasing skill-premium.
- *Decline in the average ability of medium-skill labor.* Rosenbaum argues in a recent study of the US labor market (2001) that the ability (unobserved cognitive skills) of workers with high school education had fallen considerably in 1989 relative to the level in 1959.[160] However, the ability of college graduates had also fallen, but less so in relative terms. By conclusion the labor market value of workers with secondary education had fallen relative to workers with tertiary education. However, these results may not necessarily extrapolated to the Colombian labor market, which currently has another skill distribution than the US labor market. Nevertheless, the role of this explanation is unknown in the case of Colombia.
- *Increased openness has increased demand for skilled labor.* Reductions in tariffs and elimination of most non-tariff barriers supposedly have altered the national (autarchy) price on skills to the world market price. On the world market, high returns to tertiary schooling prevail because of scarcity of skilled labor in the world.[161] In the case of Colombia, the increase in skill-premium due to a change from autarchy prices to national prices is unsatisfying. The argument hinges on national endowments of skilled labor exceeding the world

158. The minimum wage is expected to affect returns to schooling negatively. A rise in a binding minimum wage increases the wage of the lowest paid workers who are mainly without or have little education. For workers with higher levels of education for whom the minimum wage is not binding, the salary will increase less. Consequently, the returns to the first years of schooling will decline. The decline in returns to schooling would be mitigated if wage contacts above the minimum wage were nominated in multitudes of the minimum wage.

159. See EIU, 2001, p. 49.

160. Rosenbaum uses educational ranks as a proxy for ability. Thus, even after controlling for education and cohort, he finds a strong positive relationship between educational rank and the verbal abilities of students as gauged by the WORDSUM test (2000).

161. Sachs and Shatz (1996) discuss the theoretical foundations for the openness-explanation.

market's endowment, which is rarely the case for developing countries. Nevertheless, increased openness could still have impacted the returns to education, if the increased openness implied a significant transfer of new technology that in turn altered returns to schooling.

- ☐ *New technology has increased demand for skilled labor.* Since, new technology is primarily accessible by workers with higher education, the demand for skills rises as new technology is introduced in the economy. Notwithstanding the relative low level of transfer of technology, numerous sources document that Colombia have made substantial improvements in introducing new technologies into the economy, especially with regards to the information and communications technologies. Thus, in 1998 Colombia was the most active country in the Latin American region with regard to investments in the telecommunications sector. Likewise, no other country in the Latin American region matches Colombia with regard to the level of e-commerce and aggregate investments in information and communication technologies (measured in relative terms).[162] Thus, the evidence suggests that the Colombian economy relies on a number of new technologies favoring highly skilled labor. See Pavcnik and Goldberg (2002) finds some evidence that the trade-liberalization—through the introduction of skill-biased technology—led to a higher wage premium to skills.
- ☐ *Change in the relative size of sectors in the economy.* If sectors with relative high demand for skilled workers have expanded, then total demand for high skills would increase.[163] The available evidence lends some support to this hypothesis. Thus, the relatively knowledge intensive services sector has with an annual growth rate of about 5% throughout the 1990s, been the most expansive sector in the Colombian economy, whereas most other sectors have been in decline reflecting the general recession.[164]

From the evidence shown this far, it is plausible that multiple factors are at play. The supply-explanation could account for the falling returns to primary and secondary education. Moreover, the introduction of new technologies has arguably favored highly skilled labor at the expense of less educated labor.[165]

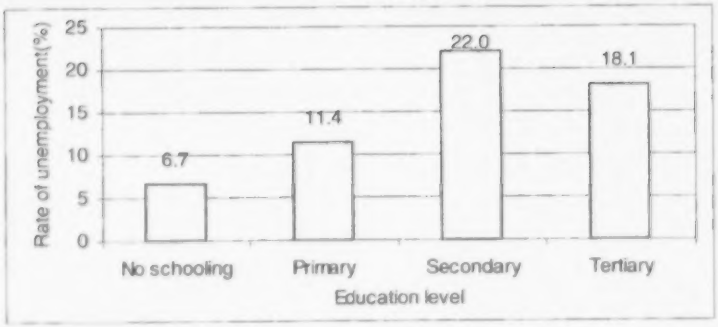
High Unemployment and Its Causes

The rising wages observed among tertiary graduates, which in turn mirrors rising demand for highly educated labor, should by implication lead to falling unemployment for this type of workers. Did this occur in Colombia? Figure VI-4 presents unemployment rates by education group. High unemployment plagues the Colombian economy as a consequence of the general economic recession. Thus, unemployment rates have more than doubled from the levels of the mid 1990s for all education groups and stood at the end of the century at 19.5%, the highest rate in Colombian recorded history.[166] With regard to the current level of unemployment, the unemployment rate appears to be rising with level of education until secondary education, where more than one in five has no job, and then falls slightly to around 18 percent for workers with tertiary education.

By first glimpse, the numbers suggest that education harms the prospects for employment. However, the high unemployment of well-educated graduates is partly a reflection of high youth unemployment. Thus, realizing that the young age groups make up a disproportionately large

162. See IMD, 2001; WEF, 2000, WDI, 2001. See also Agapitova et al. (2002).
163. See Katz and Murphy (1992).
164. WDI, 2001, p. 194.
165. This explanation is in line with findings for other countries; see for example Murphy, Riddle and Romer (1998), Arbarche (2002), Pavcnik *et al.* (2002) for Brazil and Blom et al. (2001).
166. See Appendix and Country Commercial Guide, 1999.

FIGURE VI-4: HIGHLY EDUCATED SEEMS UNEMPLOYED
Unemployment rate by education level 2000

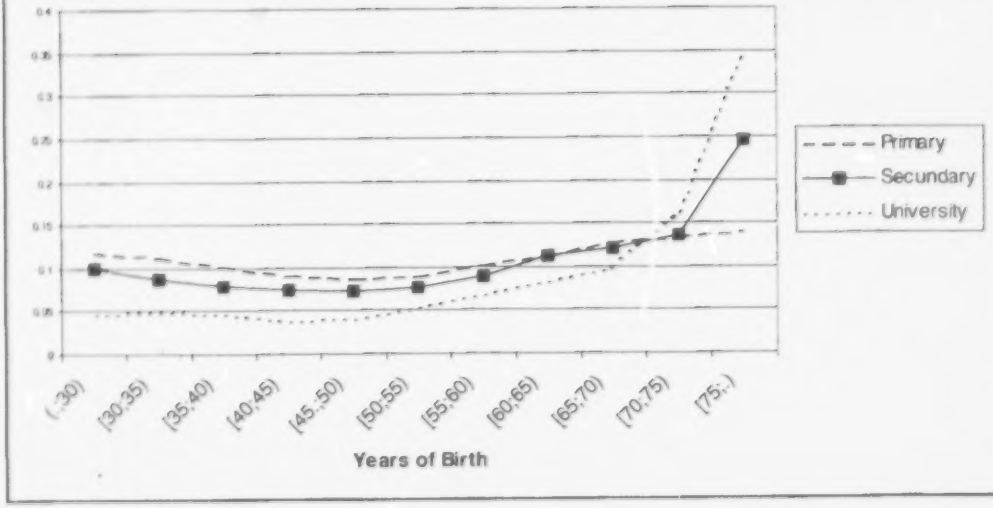


Source: DANE

share of the highly educated, the existence of high youth unemployment translates into high unemployment for the well educated.

Figure VI-5 confirms this picture. Thus, focusing on the youngest birth cohorts born after 1970, it becomes clear that the level of unemployment among the highly educated is markedly higher than the level of unemployment among the less educated. However, with regard to the older birth cohorts born between 1930 and 1970, the level of unemployment is consistently lower for highly educated than the less educated.

FIGURE VI-5: HIGH YOUTH UNEMPLOYMENT EXPLAINS THE ABNORMAL UNEMPLOYMENT LEVEL
(Unemployment by education group and birth cohort)



Note: Males only
Source: Angel-Urdinola (2001) based on Encuesta de Hogares 1982–2000

High youth unemployment can to some extent be explained with the existence of a rigid labor code in Colombia.[167] This rigidity is a major obstacle to the development of the economy, especially knowledge-based sectors, which demands flexible labor and short-term appointments.

Furthermore, the high unemployment rate for workers with tertiary education likely depends upon the type of acquired tertiary education. Thus, the experience from Venezuela and Chile has drawn attention to the fact that technicians from poor quality institutions have found it extremely difficult to find a job after graduation. However, due to lack of individual data distinguishing between the labor market performances of graduates with different kinds of education, the economic analysis is unable to identify whether the high unemployment rate for tertiary graduates is related to deficient quality in certain segments of the tertiary education system.[168]

The Market for Higher Education

The private benefits from higher education are substantial and have increased for the last several years, suggesting that the benefits outweigh the costs. According to economic theory, such a situation would induce economic agents—operating in a well functioning market—to undertake additional investment in human capital and thereby acquire higher education. Within a medium-term time frame, the supply of skilled labor would increase and put a downward pressure on the wage premium to workers with higher education. Simultaneously, the increased supply would translate into greater productivity, higher labor market income and production. Nevertheless, the persistently high (and rising) returns to tertiary education, combined with the decline in first time enrollments into tertiary education that occurred in Colombia in the late 1990s, points to the existence of one or more barriers to a smooth functioning of the market for higher education. This section takes the initial steps towards explaining the underlying economic reasons and choices behind the current situation by applying a supply and demand framework.

The supply of seats in tertiary education increased markedly in the 1990s (Figure VI-6). Starting from a supply of 180,000 seats in 1990, the system expanded considerably and offered, at its peak in 1998, 415,000 seats (130 percent increase). The expansion was primarily driven by the expansion of private establishments that increased supply from 119,000 to 309,000 seats (160 percent increase).

Concurrently, the potential demand for tertiary education—measured as the number of graduates from secondary education that took the ICFES-exam—increased.[169] Nonetheless, the continuation rate from secondary education declined. Three hundred thousand youngsters took the ICFES-exam in 1990, and of those 180,000 (52 percent) made it to tertiary education. By 1999, the potential demand had increased to 568,000, but only 367,000 enrolled (37 percent). Hence, a divergence between potential demand and realized demand occurred. Or in other words, the continuation rate from secondary to tertiary decreased. The fall in realized demand for tertiary education is arguably influenced by perceptions of high unemployment rates, low quality education and the economic recession in general. Thus, even though the long-term pay-off from tertiary education has increased significantly, the short-term risk of unemployment makes tertiary education less attractive.

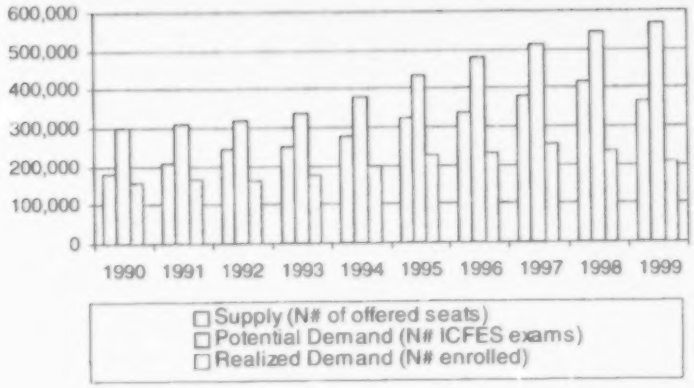
The falling continuation rate has taken place within a system that is increasingly experiencing vacant seats. For the sector as a whole, supply surpassed demand generating an oversupply of seats. Moreover, the oversupply increased throughout the 1990s. At the start of the decade, only 22,600 seats were left empty at the start of the semester (Figure VI-7). As institutions increased their

167. See Country Commercial Guide, 1999, p. 73

168. This knowledge is important not only for social planners and education policymakers but also for the graduate from secondary education who is about to choose the school and field of study. Should she or he choose to study fine art where unemployment is possibly low or become a technician where unemployment could be high? See Lopez (1992) and Ibis (1996).

169. ICFES is the national high school exam administered by the *Instituto Colombiano para el Fomento de la Educación Superior*.

FIGURE VI-6: SUPPLY AND DEMAND OF SEATS IN HIGHER EDUCATION



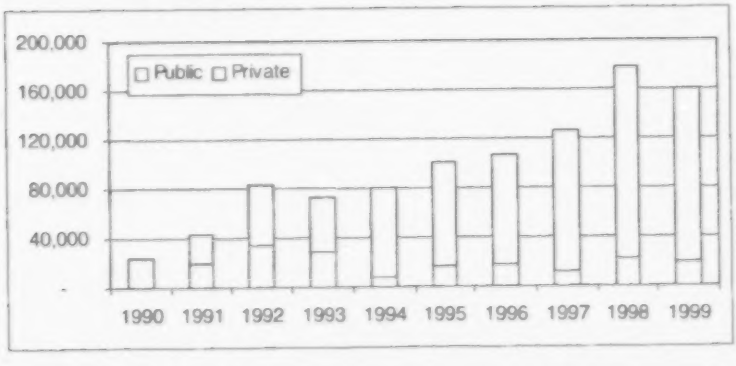
Source: ICFES *Estadisticas de la Educación Superior* various years

supply of places during the decade, the number of vacant seats increased as well. By the end of the decade, 159,000 offered seats were left unoccupied, which marked a slight decrease from the peak in 1998 of 178,000 vacancies. The slight fall is possibly a rational readjustment to the oversupply.

Investigating the oversupply in more detail, it is observed that the oversupply occurred primarily in the private sector. In 1990, public institutions had enrolled more students than they offered seats, while twenty-two thousand seats were available in the private sector. During the decade, the public institutions experienced only a small number of vacant places, whereas private providers witnessed significant increases in the number of vacant seats. In 1999, vacant seats in public institutions accounted for only one out every ten vacancies.

Households, hence, clearly—and understandably—distinguish between the low fee-charging public sector and the high-fee charging private sector. Low fee-charging higher education continues to be in strong demand, which outstrips supply, and therefore leads to rationing in the market

FIGURE VI-7: OVERSUPPLY OF PRIVATE SEATS (NUMBER OF VACANT SEATS)



Source: ICFES *Estadisticas de la Educación Superior* various years

segment for public higher education. The opposite situation arises in the segment for high-fee charging private education, where supply exceeds demand implying a growing oversupply. This signals a clear fragmentation of the market for higher education based on the level of fees.

The importance of income in a household's decision to enroll a son or daughter is strongly confirmed by Figure VI-8 that presents enrollment rate by economic quintile. Tertiary enrolment is presently (2000) towering around 35% for the richest quintile (1st), whereas the tertiary enrolment rates for the lowest income quintile is 8.4% and the average rate 16.7%. Thus, the tertiary enrolment rate of the richest quintile is approximately 20 percentage point higher than average rates. This, in turn, represents a significant change from the 1990 level where the tertiary enrolment ratio of the richest was only about 10 percentage point higher than the average level. Hence, the knowledge gap between the rich and the not so rich is growing in absolute terms.

Still, tertiary enrolment has been increasing for all income levels and measured in relative terms the poorest income quintile has noted one of the strongest increases in tertiary enrolment rates over the last decade, second only to the increase of the richest quintile (see appendix figure).

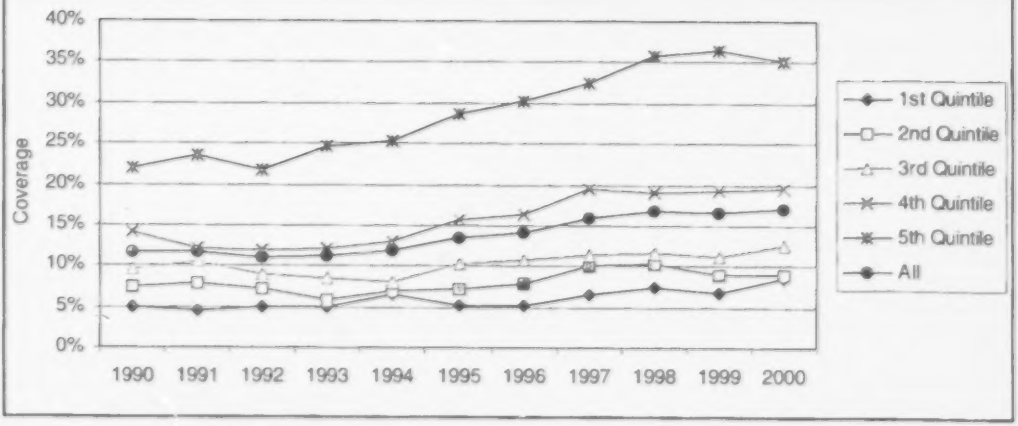
Summary and Policy Recommendations

This paper has in broad lines presented, described and analyzed the attainment, reward and employment-prospects of education in Colombia for more than two decades. Considerable progress has taken place, yet the education and income gaps vis-à-vis the high-income countries still remain high. The following paragraphs highlight the paper's major findings:

- *Educational attainment:* ***Workers with highly-advanced skills have become relatively scarcer.*** During the last two decades, the enrolment in secondary education has expanded at a significantly faster pace than tertiary education. Consequently, highly trained workers are in short supply compared to workers with middle levels of education.
- *Remuneration of education:* ***The reward for tertiary education in the 1990s doubled during the last ten years.*** Simultaneously, the value of lower levels of education stagnated. By implication, higher education has become the most effective protection against poverty. The return to tertiary education, 18 percent, exceeds by far the level of lower levels of education and the level in developed countries. Multiple factors orchestrated this evolution, most

FIGURE VI-8: TERTIARY ENROLMENT IS STRONGLY DEPENDENT UPON THE LEVEL OF INCOME

Tertiary enrolment by income quintile, 1990–2000



Source: Encuesta Nacional de Hogares

notably, the falling relative supply, the introduction of new technologies and sectoral changes following from these changes.

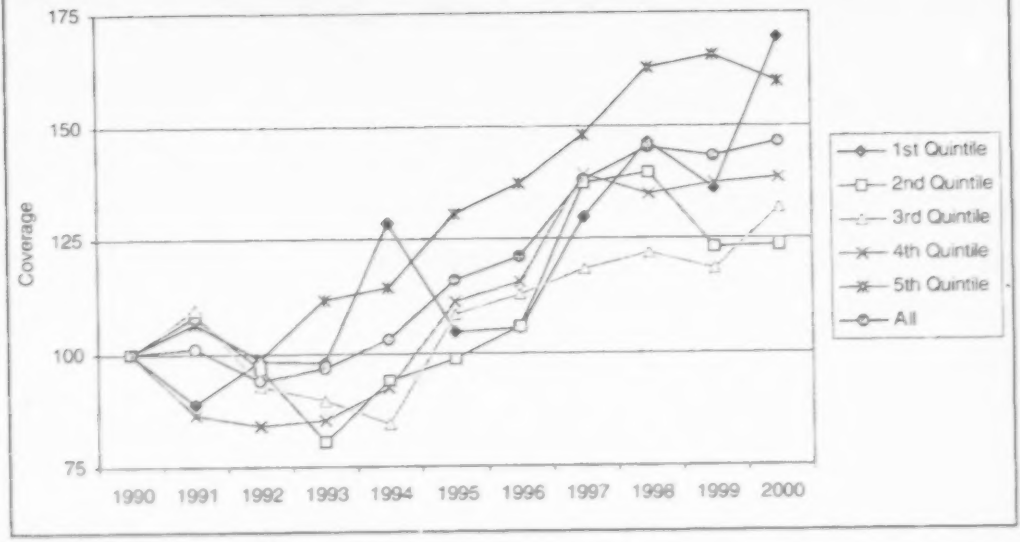
- ☐ *Unemployment:* ***Unemployment among tertiary workers increased 83 percent the last 5 years.*** The abnormal high unemployment among graduates from tertiary education is arguably a reflection of high youth unemployment and the existence of a rigid labor code. This, in turn, points to the need for fueling growth and deregulating the labor code. Otherwise, the economic benefits associated with tertiary education will remain brittle.
- ☐ *Market for Higher Education:* ***There exists under-supply of places in public universities, but ample over-supply of places in the private universities.*** Realizing that fiscal restraint is paramount for macro-economic stability in Colombia, it is not recommended to expand the supply of seats in public tertiary education through increased funding. This policy would equally have negative consequences for the equity of public spending, since expenditures to higher education are among the most regressive in the budget. Instead, it is recommended to stimulate the demand for tertiary education. This, in turn, can be done by improving the quality of education and provide finance to cover the necessary investments (tuition and time) that tertiary schooling necessitates. A successful financing reform of higher education aimed at increasing coverage should therefore stimulate demand for private tertiary education provided that the quality and relevance of these programs are improved.

TABLE VI-3: RATE OF RETURNS BY EDUCATION LEVEL

Year	Primary	Secondary	Tertiary	Post-graduate
	7.4%	8.5%	9.4%	1.9%
1982	(15.0)	(30.6)	(20.8)	(–0.4)
	6.9%	8.1%	10.3%	–6.2%
1983	(12.8)	(28.4)	(22.2)	(–1.6)
	5.6%	8.3%	9.0%	–2.6%
1984	(10.4)	(28.4)	(19.4)	(–0.7)
	6.0%	8.2%	8.7%	–0.7%
1985	(9.6)	(24.3)	(16.4)	(–0.2)
	6.3%	7.5%	11.1%	0.2%
1986	(10.4)	(25.1)	(24.1)	(0.0)
	6.9%	7.9%	9.3%	9.2%
1987	(12.2)	(27.9)	(20.9)	(2.3)
	7.2%	8.2%	14.8%	5.9%
1988	(20.3)	(48.3)	(55.2)	(2.2)
	7.5%	7.1%	10.6%	5.9%
1989	(12.9)	(26.2)	(26.6)	(1.7)
	7.1%	7.7%	10.4%	13.5%
1990	(10.8)	(25.4)	(23.2)	(3.8)
	5.2%	7.6%	10.9%	3.9%
1991	(8.0)	(25.7)	(24.7)	(1.2)
	7.1%	8.2%	16.6%	4.5%
1992	(16.4)	(41.1)	(54.7)	(1.6)
	6.2%	7.3%	16.1%	18.7%
1993	(14.6)	(38.1)	(54.8)	(6.4)
	5.9%	7.9%	17.0%	16.5%
1994	(13.3)	(40.2)	(57.6)	(6.0)
	6.1%	7.2%	17.5%	16.8%
1995	(14.0)	(38.0)	(60.9)	(7.1)
	6.9%	7.4%	18.0%	17.2%
1996	(16.1)	(41.9)	(67.0)	(9.4)
	7.9%	7.6%	17.2%	14.2%
1997	(16.6)	(38.0)	(59.2)	(9.4)
	5.4%	6.8%	18.6%	15.5%
1998	(10.8)	(32.5)	(61.5)	(11.2)
	7.3%	7.1%	18.3%	19.1%
1999	(13.3)	(29.8)	(53.9)	(11.7)
	8.6%	7.7%	18.5%	16.2%
2000	(15.2)	(31.5)	(52.6)	(12.3)

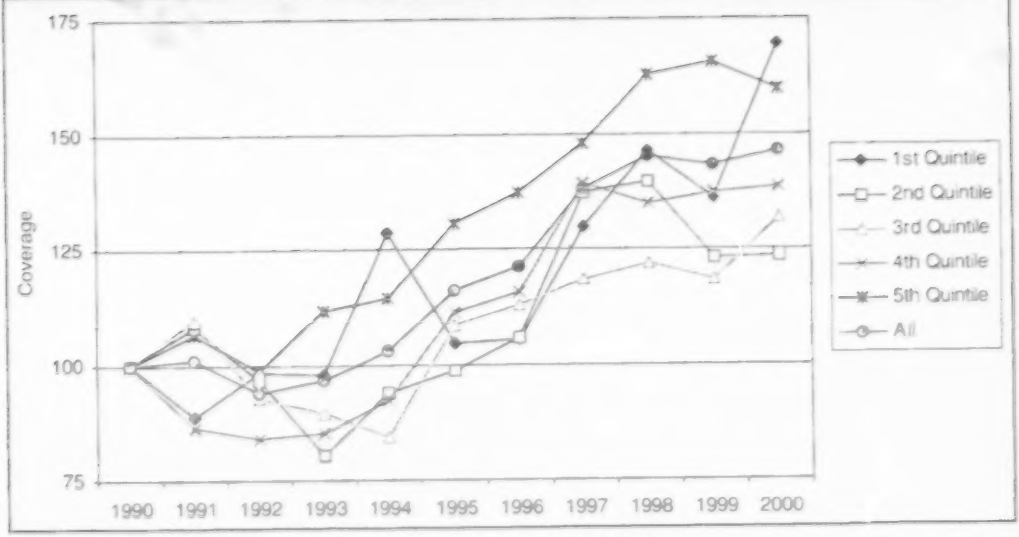
Source: Asian Development Bank.

FIGURE VI-9: RELATIVE INCREASE IN TERTIARY ENROLMENT APPLIES TO ALL INCOME LEVELS
Indexed-tertiary enrolment-ratios by income quintile (1990=100). 1990–2000



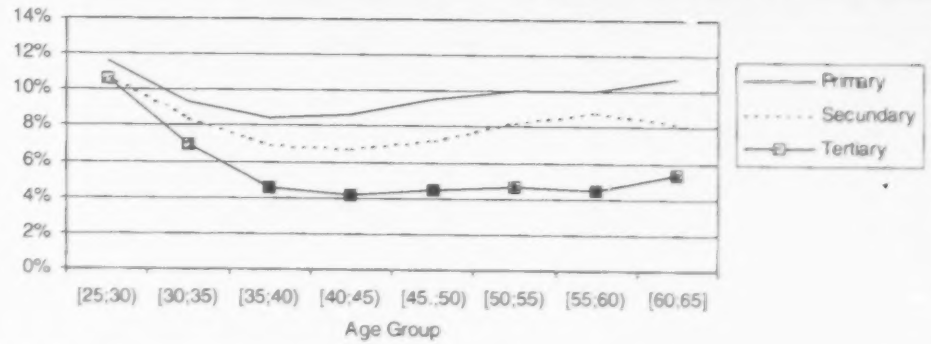
Source: Encuesta Nacional de Hogares

FIGURE VI-10: LABOR MARKET INEFFICIENCIES AND RECESSION HAS LED TO ABNORMAL HIGH UNEMPLOYMENT
(Unemployment by education group. 1982–2000)



Source: Angel-Urdinola (2001) based on Encuesta de Hogares 1982–2000

FIGURE VI-11: UNEMPLOYMENT RATES BY AGE



Source: Encuesta de Hogares

Annex VII

Reforming Student Financial Aid: Issues and Alternatives

Prepared by Arthur Hauptman

Introduction

Colombian policymakers have decided that the expansion and reform of the existing student aid programs, particularly student credit, should represent a primary vehicle for addressing challenges to the Colombian higher education sector. Thus, a principal objective is to consider how reforms in the student aid programs—scholarships as well as student credit—can help to address pressing problems in the higher education sector. To this end, this annex poses a series of related questions that government policy makers, institutional officials, and other stakeholders in Colombia ought to consider in designing student aid reforms. These questions include:

- What is the existing aid structure in Colombia?
- What are the strengths and weaknesses of the existing aid system?
- What are the problems and challenges to Colombian higher education that the proposed reforms in student financial aid should attempt to address?
- Under a revised financing structure, what should be the mix between student aid and direct support of institutions?
- Under a revised student aid structure, what should be the mix between scholarships and credit?
- Should scholarships continue to be provided through need-based tuition and discounts or should the government restructure the system to operate more like a voucher?
- Should the new student credit structure be built on existing efforts or should an entirely new system be constructed?

Summary of Suggested Changes

In the process of addressing the questions listed above, this annex comes to a series of conclusions regarding the future size and scope of student financial aid in Colombia. These conclusions include the following principles for reform and specific features:

Principles for Reform of the Student Aid Structure in Colombia. To ensure a more effective and more equitable student aid structure in Colombia, the analysis in this annex suggests that the following principles should govern any reform effort:

The reformed student aid structure should be utilized to improve the quality and relevance of the higher education sector as well as increase access. In most countries, student aid programs are created to provide greater access with relatively little concern for their impact on quality and relevance. In Colombia, a reformed student aid structure should seek to improve quality and relevance as well as expanding access. One way to use student aid reforms to improve quality would be to require that student aid recipients attend a program that is judged to be of adequate quality as measured by its ranking in an accreditation process in which programs, not institutions, are the primary focus of the investigation. To use student aid to improve relevance, aid recipients might be required to enroll in programs judged to be of high national priority to receive government-funded scholarships or to borrow under the expanded student credit program.

The share of government funding devoted to student aid should be increased and any reform effort should include an expansion of both scholarships and credit. The existing student aid effort in Colombia is small relative to the overall level of government support for higher education—less than one percent is devoted to aid—and the support is slanted toward credit, with more than 95 percent of all government-funded aid being in the form of loans. A key element of any reform strategy should be to increase funding for student aid for both scholarship and credit activities. This additional support for student financial aid might be funded through a reallocation of funds otherwise provided directly to institutions or through additional government funding of higher education. It is not recommended that World Bank loan funds be used to finance this increase in scholarships in the long term, although some start up funding in the short-term might be appropriate.

Scholarships (scholarships) should be the key policy for meeting the needs of qualified students from the lowest income families. To the extent that student credit programs are typically more tailored to meet the needs of middle class students, it will be important that a substantial portion of any increase in student aid funding be used to augment scholarships. To ensure that this scholarship assistance is targeted on poor but deserving students, these scholarships should be awarded on the basis of both financial need and academic merit. Under such an aid structure, students with the high need and high merit would be eligible for scholarships while students with some need and/or merit would be eligible to borrow. This arrangement between scholarships and credit is illustrated in Chart 1.

The existing student credit system that relies on ICETEX and banks should be built upon to expand the availability of student credit rather than create a new structure. In most countries, student loan default rates are unacceptably high and any reform of the student credit system therefore must include a radical restructuring or possibly a completely new program. This is not the case in Colombia since it has one of the oldest student credit programs in the world with respectable rates of repayment. These strengths suggest that the existing structure should be modified rather than scrapped. The weaknesses of existing structure that need to be addressed include a lack of liquidity and a lack of coverage, with less than 10 percent of all students borrowing in recent years.

To increase coverage, it will be necessary to utilize the private sector as a source of capital since it is unrealistic to expect the government to provide the necessary funding. Expanding coverage of credit to, say, 20 percent of all students—roughly doubling current coverage rates—would require more in loan capital that it is realistic to expect the government to provide in the current environment. Thus, private banks, which already have demonstrated a capacity to innovate in meeting demand for student credit in Colombia, must play a central role in the new loan structure by providing the initial capital for many new loans. To ensure that the banks have an incentive to

maintain a good repayment record, they should share in the risk of loss. In addition, ICETEX must continue to be a source of credit for students who do not qualify for bank-based loans.

A key reform needed in Colombia is to establish a secondary market (second floor bank) to increase liquidity of the student credit system. Several existing organizations might be assigned this responsibility, including ICETEX, or a new one could be created. A critical aspect of implementation of student aid reforms in Colombia will be to determine whether ICETEX as an organization is capable of accepting this responsibility. Based on ICETEX's response to data requests in the development of this annex, there are real questions regarding its capacity to administer a second floor bank.

Whatever group or organization is assigned the responsibility for serving as a secondary market, private investors such as pension funds and individuals must be relied as a source of financing and should be assured a competitive return on investment. A description of how such a system might work in Colombia is provided below. In terms of the roles of various organizations already involved in providing aid, the following is contemplated:

- The role of the government under the reforms proposed in this annex would be two-fold: 1) to establish through legislation and to provide start up funding for a student credit secondary market (second floor bank) to provide greater liquidity and 2) to provide a guarantee fee to ICETEX for new loans that it makes directly to students. It is recommended that this fee should be paid upfront as a percentage of loans guaranteed rather than as an open-ended commitment that would guarantee lenders or note holders a portion of losses on all loans made.
- The role of ICETEX would be: 1) to continue making and servicing loans to students who do not meet credit worthiness standards in the bank-based program, and 2) to possibly become a secondary market for both bank loans as well as those made by ICETEX. If ICETEX were to become a secondary market, its role as a public entity would become more blurred because it would now be using private investor funds to finance its second floor banking activities.
- The role of commercial banks in providing student credit would continue largely as it is now—to lend to credit worthy student borrowers and to service those loans. Bank-based loans, though, would expand beyond the traditional role of providing of short-term credit because the creation of a secondary market would allow for longer terms.
- The role of Fondo Guarantia in student crediting would also remain largely as it now is—to guarantee a portion of the loans made by the private banks with which it has agreements, although its mix of student credit would shift to longer term instruments.
- The role of HE institutions would be to accept less than the face value of the loan as payment for an equivalent amount of tuition fees. This would be key for allowing student borrowers to be charged an interest rate below market conditions. The government should also take steps to encourage HE institutions to provide more non-repayable aid to their students through need-based tuition or discounts.

What is the Existing Aid Structure in Colombia?

Student financial aid is currently made available to Colombian students through: government-funded scholarships (scholarships); discounts from tuition and fees offered by public and private institutions of higher education; and student loans (credit).

Government-Funded Scholarships. The national and state governments provide very little in the way of scholarships through a formal funding process. At the national level, funding for scholarships amounted to less than 1 percent of total government funding for higher education, providing scholarships for an estimated 25,000 or less recipients in 2000.

The government-funded scholarships are administered on a decentralized basis through agencies such as ICETEX, COLCIENCIAS, and COLFUTURO. In each case, the government funds the agency that in turn administers the programs according to government rules. The scholarship

programs administered by ICETEX are listed in Table VII-2 and range from scholarships for study abroad to a series of programs that fund scholarships for specific groups of students. COLFUTURO funds only graduate students who study abroad while COLCIENCIAS funds assistantships for research-related activities.

Discounts Provided by Institutions. A more substantial amount of financial aid is provided through the discounts that both public and private HE institutions in Colombia provide to their students. At public institutions, these discounts are provided mostly through the need-based tuition and fee system in which students are charged on the basis of his or her family financial circumstances. Under this need-based tuition system, family income, family size, area of residence and other factors are used to calculate need or ability to pay. This use of need-based tuition distinguishes Colombia from most other countries where tuition levels are the same regardless of student circumstances and financial aid is used to help students from lesser circumstances. There appears to be no reliable data on how much aid is provided through need-based tuition, however.

At private institutions, scholarships now are more typically in the traditional form of discounts from the stated tuition and fees. In the past, many private institutions engaged in charging need-based tuition, but most in recent years have switched to a fixed tuition *in part* because of mounting concerns that many students were 'gaming' the system by understating their family resources. Now only a few private institutions have need-based tuition systems like those in place at most public institutions. As in the case of public institutions, there are no systematic data on how much aid is provided through discounts by private institutions. But we do know that roughly 500 thousand students are enrolled in private institutions and that tuition levels range from a low of US $300 to a high of US$ 2000. If the average level of tuition is US$ 1000, then total tuition revenues would be roughly US$ 500 million. If 20 percent of students receive a partial discount of half tuition, that would mean the total level of tuition discounting amounted to an estimated $US 100 million in 2000. This figure would undoubtedly dwarf the funds formally allocated through the government to student aid through the government.

Student Credit. There are two types of credit programs available to students attending Colombian institutions of higher education. In addition, another credit program is available to students studying at institutions abroad.

1) Colombian Institute for Education Credit and Advanced Studies Abroad (ICETEX) ICETEX is generally acknowledged as the oldest government sponsored student loan program in the world. It was established in 1950 and began operations in 1952 so it legitimately is celebrating its silver anniversary. It is often viewed as a model for other countries to emulate in making credit available to their students. Initially, ICETEX was formed to provide loans to students studying abroad. But in 1968, eligibility for loans from ICETEX was expanded to include students enrolled in Colombian HE institutions. As Table VII-2 shows, the changes made in 1968 led to a substantial expansion in ICETEX activities over the following three decades. In addition, an increasing share of ICETEX activities has been for borrowers engaged in domestic studies; in the 1990s, more than 95 percent of its lending was to students enrolled in domestic institutions.

Type of Credit. Students borrowing through ICETEX may participate in a number of different types of credit programs. For students studying in Colombia, three types of credit are available:

Long Term. The most popular of ICETEX programs, for long term credit students repay the entire loan amount upon completion of their studies [interest in school as well?]. Undergraduates may borrow up to 70% of tuition at private universities and up to 100% of tuition at public universities. Graduate students may borrow up to 80% of tuition.

Medium Term. Borrowers may also borrow medium term credit by repaying half of what they owe while still in school with the remainder financed upon completion of studies. Students may borrow medium term up to 90% of their undergraduate tuition and 80% of their graduate tuition.

TABLE VII-1: 50 YEAR TRENDS IN NUMBER OF BENEFICIARIES UNDER ICETEX

Type of service	1952–1959	1960–1969	1970–1979	1980–1989	1990–2000	Total
Country Loans	**748**	**15,781**	**123,493**	**250,081**	**465,719**	**855,822**
Undergraduate	748	15,781	119,164	231,713	372,147	739,553
Postgraduate	–	–	4,329	18,368	52,136	74,833
Loans from TAE resources	–	–	–	–	41,436	41,436
Foreign Loans	**681**	**3,981**	**3,523**	**5,931**	**7,529**	**21,645**
Undergraduate	–	–	–	–	414	414
Postgraduate	681	3,981	3,336	4,864	5,979	18,841
Language Training	–	–	–	–	635	635
Scholarship-Loan	–	–	–	347	128	475
Student transportation	–	–	187	720	373	1,280
Domestic Scholarships	**–**	**–**	**231,505**	**130,720**	**244,706**	**606,931**
Primary Rural education	–	–	28,197	44,799	–	72,996
Secondary Rural education and PACES*	–	–	186,027	85,921	244,706	516,654
Teacher's training	–	–	17,281	–	–	17,281
Foreign Scholarships	**44**	**1,084**	**6,744**	**7,971**	**11,540**	**27,383**
International cooperation scholarships	34	812	6,141	6,693	6,903	20,583
Arts	–	42	107	507	32	688
Miguel Antonio Caro project stays	–	–	–	–	180	180
Inter-campus	–	–	–	–	1,198	1,198
Foreigners in Colombia	10	230	496	771	3,227	4,734
Other initiatives	**1,099**	**19,665**	**53,287**	**1,331,243**	**620,019**	**2,025,313**
Technical training assistance (law 100)	–	–	–		10,240	10,240
Black communities (law 72/)	–	–	–		5,855	5,855
Indigenous communities assistance	–	–	–		3,297	3,297
Carolina Oramas assistance to Colombian artists	–	–	–		286	286
Solidarity Network	–	–	–		12,897	12,897
Funds under management**	624	3,435	31,820	58,287	184,099	278,265
MEN Program—parents	–	–	–	21,295	21,295	
Regional Development (APORTES)	–	–	6,119	1,263,360	190,399	1,459,878
Authorization of funds to go abroad	475	16,230	15,348	9,596	191,651	233,300
Total	**2,572**	**40,511**	**418,552**	**1,725,946**	**1,349,513**	**3,537,094**

Source: ICETEX

TABLE VII-2: ICETEX INTEREST RATES AND OTHER INDICES, 1991–2001

	ICETEX interest rate (%)	Inflation (CPI)	Real interest rate	Commercial bank rate (%)
1991	24	26.8	-2.8	46.1
1992	24	25.1	-1.1	34.8
1993	24	22.6	1.4	36.4
1994	24	22.6	1.4	39.9
1995	24	19.5	4.5	43.2
1996	24	21.6	2.4	43.2
1997	24	17.7	6.3	33.8
1998	24	16.7	7.3	50.5
1999	22	9.2	12.8	27.3
2000	22	8.8	13.2	23.9
2001	22	7.7	14.3	31.0

Source: ICETEX

Note: Commercial rate is from June each year.

Short-term. Undergraduate and graduate students may borrow short-term up to 100% of their tuition, repaying it fully during the year in which they borrow in six monthly payments.

Credit is also available through ICETEX to support study abroad, including:

Graduate Studies. Students enrolling in graduate studies abroad may borrow up to US$8000 for a maximum of two years with repayment commencing within three months after studies are completed and fully payable within 5 years.

Language Courses. Students enrolling in language courses abroad can also finance through loans of up to $4000 payable within 30 months after studies are completed.

Student travel. Students may also borrow short term up to 100% of their international travel costs to be repaid one month after traveling.

Interest rates. Under each of these ICETEX programs, interest rates are set by the Directive Committee but cannot exceed limits established by law. The ICETEX interest rates from 1991 to 2001 in comparison to other rates and inflation are shown below.

Administrative Structure. In the ICETEX programs, students apply to one of the 21 regional offices of ICETEX, usually the one nearest their residence. Students are selected on the basis of their financial need as calculated by ICETEX, their academic performance, and the type of institution attended. Institutional criteria are critical in some cases and in every case, students must be enrolled in programs of study registered with ICHFIS. But ICETEX makes no differentiation in lending priority on the basis of the potential borrower's field of study. When demand for credit exceeds supply of credit, priority is given in order of: 1) academic performance, 2) financial need, and 3) whether students are enrolled in public institutions. In terms of who receives the proceeds of the loan, students and their families receive the first disbursement to help them pay the initial tuition charge while all subsequent payments are made directly to the institution.

Sources of Funds. ICETEX relies on four principal sources of funds to finance the loans and scholarships they provide to students. These sources are:

Private and government third party trusts. In recent years, the growing source of funds for ICETEX loans has been trust funds deposited by private sector organizations or government agencies for the purpose of making loans to the children of their employees.

ICETEX's own resources. Another important source of revenue to ICETEX are the repayments on outstanding loans, interest on investments and trust funds, and commissions.

Family Savings Plans. In recent years, a small but growing portion of revenues are the funds that families deposit with ICETEX that can serve as collateral for loans these families borrow to help pay for their children's education.

Government transfers. In recent years, the government has not transferred funds to ICETEX for the purpose of making new loans. This is the principal reason for the decline in loan coverage over the past decade from roughly 12 percent to 6 percent.

ICETEX sources of funds in the year 2000 are indicated on Table VII-3 below.

Bank-based Student Credit

Financing of student credit through the private banking system has become more commonplace in recent years, in part to meet the growing unmet demand for credit created by the declining coverage of ICETEX. Under this credit approach, Colombian banks have formed partnerships with individual HE institutions to provide short-term credit for students at those institutions. One bank has formed arrangements with as many as 30 institutions, another makes loans to students enrolled at a dozen institutions. For the most part, these loans have been in the form of short-term credit that must be fully repaid before the borrower completes his or her studies.

In the past several years, Fondo National de Garantias (FNG), a government-sponsored guarantor of commercial loans, has guaranteed the loans at two banks offering student credit as a way to allow banks to make longer term student loans. ICETEX provided a substantial share of initial funding of this venture in an effort to expand longer term credit coverage to middle income students who do not qualify under the need restrictions of ICETEX lending. FNG guarantees the outstanding balance of capital and unpaid interest on loans made to students from families in the upper two income quintiles. It provides 60 percent guarantees for loans with repayments of less than 3 years and 70 percent guarantees for loans with repayment terms exceeding five years. In 2000, FNG guaranteed roughly US$500 thousand in more than 600 loans. In 2001, it will guarantee roughly 2500 loans with a face value of US$2 million.

These bank-based efforts have exhibited a healthy degree of innovation and merit serious consideration as part of any reform effort. But coverage through bank-based student credit is also low

TABLE VII-3: ICETEX SOURCES OF FUNDS, 2000
(Col $)

Total Funds in 2000	**88,787,351,447**	**100.0%**
Third Party Trust Funds	0	0.0%
Government Agencies	0	0.0%
Private Organizations	0	0.0%
ICETEX Own Resources		
Loan Repayments	67,309,098,406	75.8%
Investment Income	3,485,368,873	3.9%
Commissions	4,379,051,307	4.9%
Government Transfers	6,676,754,280	7.5%
Other income	405,678,581	0.5%
Financial Surplus	6,531,400,000	7.4%
Gain on exchange rate	319,136,507	0.4%

Source: ICETEX

and generally has been limited to more credit-worthy middle income students. In addition, bank-based credit has been largely limited to short-term borrowing because of the absence of a secondary market (second floor banking) in Colombia that would increase the liquidity of this lending.

COLFUTURO

In the early 1990s, COLFUTURO was established to provide loans and scholarships for graduate students studying abroad, in part taking up the slack created by the shift over time in ICETEX supporting domestic rather than foreign studies. Roughly half of the support provided is in the form of scholarships/fellowships and the other half is credit. In 2000, about 140 students were aided through COLFUTURO.

What are the Strengths and Weaknesses of the Current Student Aid Structure?

One of the most striking aspects of the current debate in Colombia over the condition of the higher education sector is the degree of consensus among key policy makers and institutional officials about the need to expand the student credit system to address pressing concerns to the HE system. It is rare in most countries to find such a degree of consensus around any particular policy issue or reform. Therefore, a natural place to start a discussion of the possible need for reform in the student aid structure in Colombia is to assess the strengths and weaknesses of the current set of aid programs. Our assessment is that the current aid structure has several very important strengths that should influence the design on any new structure. These strengths include:

- *High Repayment Rates.* Both ICETEX and the bank-based system have repayment rates of 80 percent or more. This is one of the better student loan repayment records in the world. The United States now has a student loan repayment rate of roughly 90 percent but as recently as a decade ago the default rate was roughly twice as high as it is now. The reduction in defaults in the U.S. was a function particularly of two events or trends. First, the economy in the 1990s did very well and as a result borrowers found themselves more able to repay their growing debt burdens. More importantly, however, the federal government took a number of steps to reduce or eliminate student aid eligibility for students attending institutions with a record of high default rates, a step it had not been willing to take before. As a result, a number of the affected schools were forced to close down and their contribution to any student loan default problem was reduced or eliminated.
- In the case of Colombia, it appears defaults have been relatively low and the repayment rates have stayed high because of several factors. First, ICETEX lends only to students enrolled in programs approved by ICHLIS so that student credit is not extended to students enrolling in programs of questionable quality. International experience suggests that this is perhaps the most important factor in keeping default rates low. Second, especially in the bank-based program, loans are made only to credit worthy students primarily from middle class families.
- *Decentralized Administrative Structure.* ICETEX through its 21 regional offices and the national banks through their network of local offices make loans throughout the country and require little in the way of administrative support from the government or the private sector. Many years of experience with a decentralized system make a big difference in the capacity of ICETEX to provide personalized service to students.
- *Long Term Commitment to Student Credit.* In many countries around the world, there is strong opposition to the use of student credit from students and other groups in society. This typical stakeholder resistance to the establishment of high fees and the widespread use of student credit to pay for these high charges represents a major obstacle both to the

TABLE VII-4: DEFAULT EXPERIENCE OF ICETEX, 1996–2001

	Portfolio	Due	Due/portfolio	Un-recovered	Default rate
1996	132,004,742	36,623,307	27.7%	4,962,008	13.55%
1997	191,140,271	56,216,869	29.4%	7,545,161	13.42%
1998	249,665,264	81,834,685	32.8%	10,466,759	12.79%
1999	303,853,256	123,032,339	40.5%	16,062,784	13.06%
2000	364,454,727	151,845,785	41.7%	24,246,257	15.97%
2001	438,349,710	194,842,776	44.4%	34,132,036	17.52%

Source: ICETEX
Note: All in thousand pesos

expansion of higher education and narrowing the inevitable gaps in educational opportunity between rich and poor students as resources are constrained and higher education remains the domain of elite parts of society. In contrast, the concept of student credit has enjoyed strong support in Colombia. More than 800 thousand loans have been made over the fifty years that ICETEX has been in existence, with more than half of these loans being made in the 1990s alone.

But the existing student aid structure in Colombia also has a number of weaknesses, including:

- ☐ *Low Aid Coverage.* The coverage of ICETEX has declined over time so that by the 1990s less than 10 percent of students borrowed each year. For example, an average of 50,000 students borrowed each year in the 1990s compared to enrollment levels of roughly 800,000 students. This represents a reduction in coverage from the 1980s when between 10 to 15 percent of students borrowed. In addition, the current aid structure is inadequate to accommodate the large-scale expansion in student enrollments that is being contemplated as part of this project.

Scholarships also have a low rate of coverage, as less than one percent of all students receive government-funded scholarships every year. A higher proportion of students receive scholarships through the need-based tuition that all public and some private institutions charge and the more traditional discounts provided through most private institutions. But in a country that charges relatively high tuition, this level of coverage from both scholarships and loans is insufficient to meet the absolute lack of resources of economically disadvantaged students as well as the cash flow needs of many middle class students.

- ☐ *Regressive Distribution of Benefits.* The overall financing structure for higher education and the distribution of benefits in Colombia is slanted towards the middle class for three related reasons: First, virtually all government funding for higher education is directed at direct support of institutions. To the extent that middle and upper class students constitute most of the student enrollments (as in the case in almost all countries), this is a regressive way of allocating government funds. Second, a large proportion of the very small amount of student aid that is provided is devoted to credit rather than scholarships. More than 95 percent of all student aid in Colombia is provided in the form of credit that is largely provided to students from middle class families. Third, the traditional limits in lending in Colombia, particularly by the banks to credit worthy students (to keep repayment rates high), means that low income students receive relatively little in the way of aid.
- ☐ *Lack of Liquidity.* Although the student credit system in Colombia is well established, it has suffered from a chronic lack of liquidity that has served as a major constraint on its capacity

to grow. The traditional reliance of ICETEX on the government to provide financing for student credit has been the most important reason that the volume of lending has declined in recent years as the government reduced and then eliminated its support. The absence of a secondary market (second floor bank) also has been a principal factor in preventing private banks from moving beyond the provision of short-term credit. (The other constraint on banks providing longer term credit has been an inadequate guarantee arrangement which has been addressed by the recent entrance of Fondo Garantias into the student credit market.)

Problems and Challenges to Colombian Higher Education Addressed by the Proposed Reforms in Student Financial Aid

The sector analysis identifies a number of problems and challenges that Colombian higher education now faces, including:

- Inadequate quality as measured by growth over time in the number of low quality programs of study, particularly in the private sector where quality is highly variable.
- A lack of relevance as indicated by a mismatch between what Colombian students study and the needs and the requirements of the labor market.
- Barriers to access as indicated by an overall decline in enrollments since 1997 and a continuing gap in higher education participation rates between rich and poor students.

International experience suggests that student aid programs, including credit programs, can only have limited impact on meeting the challenges indicated above. Moreover, in a number of countries, student aid policies and programs often contribute to problems such as reduced quality. For example, student aid often is a factor in the decline in quality as inferior schools or programs gain eligibility to financial aid for their students. So a critical question is whether the new aid scheme in Colombia will be used to improve quality or will it have the effect of reducing quality.

How could student aid reforms be used to address the challenges of improving quality, relevance, and access faced by Colombian higher education? Several possibilities exist:

Improving Quality. Student aid programs could be used to improve quality by limiting eligibility for student aid to those students enrolling in programs of study deemed to be of high quality through a modified and expanded accreditation process, as described in the annex on accreditation in this sector analysis.

One particular aspect of possible accreditation reform should be noted in this context. An accreditation process that focuses on reviewing programs of study more so than a full institutional review would be particularly amenable to integration with a process that uses student aid as a mechanism for improving quality. A program-based process for accreditation would allow for much greater targeting of government-funded aid on quality programs than the more common institution-based accreditation which permits much less flexibility in assessments of different programs within one institution.

Improving Relevance. To improve the relevance of government policies, eligibility for student aid could be limited to students enrolling in fields of study deemed to be of high priority by the government in consultation with various stakeholders. As a means for targeting scarce government resources, a number of countries limit eligibility for all or portions of student aid to fields of study deemed to be of high priority. These efforts take many forms, but a worthwhile way of proceeding is to engage relevant government agencies—finance, planning, economic development as well as education—and a range of stakeholders in the process of identifying high priority fields of study based on economic, demographic, and societal assessments of need. A program-based accreditation process, as described above, would dovetail well with efforts to identify priority fields of study.

Improving Access. Student aid in most countries, of course, is typically employed as a means for improving access and this should certainly be the case in Colombia as well. One obvious way to utilize student aid to improve access is to increase the availability of scholarships (scholarships) which currently account for a very small portion of government funding of higher education in Colombia. Given scarce resources, however, it is not realistic to provide scholarships to a broad range of students. As a means for targeting resources, scholarships could be substantially expanded for students who demonstrate both high merit and high need.

In addition, expanded student credit could be used to increase access by increasing the ability of a broad range of students to pay for higher education. Coverage of student credit has declined in the past decade, mostly as a result of the drying up of government funding for loan capital. Given scarce resources, it is not realistic to expect the government to resume its role in earlier decades of providing large amounts of loan capital directly to ICETEX or any other student credit effort. But this does not preclude using private capital to fund an expansion of student credit in Colombia.

The Appropriate Mix Between Student Financial Aid and Direct Support of Institutions?

In assessing the efficacy of a country's student aid structure, it is not sufficient simply to examine the policies and the operation of the student aid programs themselves. Each country should also examine its student aid structure in the broader framework of how its higher education system is currently financed and how it should be financed in the future to maximize its effectiveness. This broader set of questions relate to the four components of higher education finance: government funding of institutions; the setting of tuition and fees; providing financial aid to students; and ensuring adequate quality of programs and effective management of institutions.

In reviewing the higher education financing structure in Colombia, several characteristics are important to note in this regard:

- Overall level of support for higher education is relatively low—less than 1 percent of GDP is devoted to higher education.
- Almost all public funding for higher education is provided directly to institutions—less than one percent of total government funding for higher education is devoted to student financial aid. This figure is deceptive, however, in that the principal source of aid in Colombia is the discounts that both public and private institutions provide to their students.
- Tuition and fees at public institutions are set on a need basis and represent a major source of student financial aid. Need-based tuition ranges from less than the minimum salary to three to four times minimum salary. On average, public tuition and fees cover about half of costs per student.
- Tuition and fees in private institutions range from $300 to $2,000 per year and on average constitute about 70 percent of all revenues. Most private institutions charge a fixed amount for tuition, although some continue to charge on a need-basis similar to the public institutions in Colombia. The discounts that private institutions represent the major source of student aid in Colombia.

Despite representing a small share of all government spending for higher education, a review of the past half century indicates that student aid has played an important role in the development of Colombian higher education. Need-based tuition policies have effectively provided scholarships for many thousands of students, but the government has very little control over who receives scholarships. There is also very little data on the amount of aid provided through need-based tuition and discounts and which students receive the benefit of these subsidies.

Credit has played a relatively important role in the financing of Colombian higher education, compared to the role that student loans play in most other countries. ICETEX is among the oldest student loan programs in the world and is often viewed as a model for other countries to emulate

in making credit available to their students. But the coverage of ICETEX is relatively low and the current structure is inadequate to accommodate the large-scale expansion that is being contemplated as part of this project.

Bank-based student loans have become more commonplace in recent years, in part to meet the unmet demand for credit created by the low coverage of ICETEX. These bank-based efforts have exhibited a healthy degree of innovation and merit serious consideration as part of any reform effort. But coverage through bank-based student credit is also low and generally has been limited to more credit-worthy middle income students.

One of the first issues that policymakers thus ought to address as part of any overall reform effort is what level of government support will be available in the future for student financial aid. Any realistic assessment of the current situation suggests that the share of government funding devoted to student aid should be increased as part of any reform effort. This would allow for greater student choice than under the current system in which virtually all government funds are funneled through institutions.

The Appropriate Mix Between Scholarships and Credit?

One of the most striking characteristics of the current aid structure in Colombia is how slanted it is toward credit. While need-based tuition provided by public and private institutions is an important form of scholarship assistance, virtually all of the financial support that is provided or sponsored by the government to students is via ICETEX or bank-based loans. This is unusual in that the governments in most countries typically are not so committed to credit and provide a more substantial degree of non-repayable assistance in the form of grants, bursaries, scholarships, fellowships, or scholarships.

This Colombian tradition of relying on credit is commendable in a number of ways, including having students pay for the private benefits of their higher education and allowing institutions to charge higher fees, thereby increasing resources devoted to higher education and ultimately increasing access to higher education. This is not a point well understood in many countries where students protest the imposition of fees as a barrier to access. The fact is that countries which charge higher fees tend to have higher participation rates in higher education than those countries which charge little or no fees, precisely because of the supply enhancing effect of higher fees creating more resources. To the extent that the availability of student credit allows institutions to charge higher fees, it can rightly be characterized as an access enhancing policy.

Nonetheless, a financial aid system that relies entirely on credit can serve as an obstacle for increasing access for many of the students for whom the assistance is most intended—students from the most impoverished families. The experience in the United States and the growing number of countries that have come to rely more on student credit as a form of assistance suggests that the students from the lowest income families are the ones most dissuaded from attending because of concerns about incurring debt. Their parents are the ones most inexperienced in taking on debt as well as being the ones least likely to repay. Prospective debt burdens can also be an inhibiting factor at the graduate level as students will be disinclined to borrow especially in those fields where incomes are not high enough on average to repay what had been borrowed in a timely and manageable fashion.

This international experience suggests that credit should not be the sole focus of reform proposals in Colombia since credit is typically not a good vehicle for improving access for the lowest income students. To achieve greater access, particularly for low income students, the new aid structure should shift somewhat toward a greater emphasis on nonrepayable assistance. One possible formulation along these lines would be to:

- ☐ Establish a government scholarship program for undergraduate students with high need and high merit. A scholarship program for undergraduates that focuses on both need and merit would signal the government's commitment to use student aid both to improve quality and access for students who face the most substantial financial and other barriers to their increased participation in higher education.

- ☐ Expand the availability of credit for students who meet basic levels of need and merit. Expanded availability of student credit could stimulate increases in overall student access by allowing a range of students to borrow to help pay their fees at both public and private institutions. A reasonable medium term goal would be to raise coverage levels in student credit from the current level of less than 10 percent of all students borrowing to perhaps 20 percent. This will require a substantial increase in loan capital discussed under question G of this annex.
- ☐ Create a program of fellowships and assistantships for doctoral candidates in selected fields of study. Another chronic problem in Colombian higher education is the difficulty in attracting students to enroll in graduates programs of critical importance. Credit programs are not a good way to stimulate such behavior if after-graduation incomes are not high enough to support repayment of the loans. Fellowships and/or assistantships for students who enroll and complete their doctoral programs would be a more positive approach for addressing the problem of stimulating demand for critically-needed doctoral programs.

Within this proposed framework for reform, designers of a new or revised system of aid will need to address the following questions:

- ☐ –What should be the relative emphasis on need and merit?
- ☐ –Should the existing criteria for determining be retained or changed?
- ☐ –Which students should be eligible for scholarships? Which to borrow?

Need-based Discounts and Scholarships Versus a Voucher-System?

In addition to the reliance on credit as discussed in the preceding section, another unusual aspect of financial aid in Colombia is the relatively small role that the government has traditionally played in the provision and administration of scholarships. The traditional role of the government has been to rely on institutions to provide aid primarily through need-based tuition policies at public institutions and more traditional discounting at private institutions. A question that Colombian policymakers need to address is whether it is feasible to expand the provision of scholarships within the existing framework of institution-based assistance or whether the government needs to play a more active role in identifying and funding scholarship recipients.

One of the chief advantages of maintaining the current decentralized scholarship structure is that it minimizes the need for government staffing and costs. Virtually all of the costs are borne by the higher education institutions themselves. This type of administrative structure also allows institutional officials, who are closest to knowing the situation of individual students, to make informed decisions about which of their students most require and would benefit from the assistance being provided.

The principal disadvantage of continuing with the decentralized aid structure is that government policies may be countered by institutional decisions. For example, to the extent institutions are providing scholarships principally to middle class students as a means for recruitment, then the intent of focusing the most nonrepayable aid on the poor has been subverted. Similarly, to the extent there is widespread 'cheating' in the reporting of income by students and their families and the lack of a standard procedure for calculating student need, the effectiveness of the student aid structure is undermined.

Student aid programs that operate more like vouchers hold the advantage of providing students with a more effective choice of institutions than institution-based aid programs. On the other hand, voucher-like programs require a more extensive administrative structure than many governments have the capacity to provide. This then becomes the advantage of an institution-based aid system in which institutions shoulder the burden of administering the system and assume much of the administrative costs in exchange for being given a large degree of discretion in how public funds are to be distributed.

As an integral part of any reform effort, government policymakers in Colombia should be willing to consider this question of whether to continue to rely on the traditional decentralized approach of providing scholarships through the institutions, or to establish a more substantial governmental role

for nonrepayable assistance, either in the form of increased levels of funding or in dictating to institutions how to distribute the aid they provide.

One such expansion of the government role would be for it to become more involved in determining which students receive scholarships or fellowships without providing much if any more in the way of government funding. This result could be achieved by the government establishing rules for how institutions should administer their need-based tuition or discounts. There is certainly precedent for this. In the Philippines, for example, the government requires that private institutions provide aid to 5 percent of their students as a condition for maintaining their non-profit status and not being taxed. This provision has not been very successful in the Philippines because there is no requirement that the aid recipients be needy and as a result the aid is not well targeted. But such a requirement could be tightened to focus aid more on the most disadvantaged students.

A more extensive government role would entail establishing a government-funded program that was designed either to run through the institutions or to operate more like a voucher. In taking such a decision, there should be a recognition that institution-based student aid structures tend to be easier to administer but are less effective at providing choice to a broad range of institutions and require greater governmental monitoring of institutions than voucher-like programs. The shift to a voucher-like structure, however, could entail a substantial effort both in terms of resources and effort.

Built Entirely New Credit Structure or Develop Existing Structure?

Perhaps the most important issue that must be addressed in short order in redesigning student financial aid in Colombia is whether the future student credit system should be based on the existing structure or whether a new system is needed. In most countries, the answer to this question would be easy to provide: a new system would be needed because high default rates and ineffectual administrative systems require a rethinking of what has been done in the past.

In Colombia, this question is more difficult to answer than in most other countries because ICETEX is among the oldest student loan programs in the world and its record of repayment is well above average. These conditions of long experience, ICETEX's well established reputation both within Colombia and as a model for other countries, and a reasonable history of repayment are all strong reasons for building a new student loan program on the foundation of the existing one.

There are reasons, however, to consider starting from scratch and building a new student loan program rather than rely on ICETEX. One reason is that in the course of developing this sector analysis and this annex it became obvious that ICETEX has its problems. Relatively simple data requests required much too long response times suggesting that record keeping and data analysis are lax within the organization. There are concerns that administrative costs are high, although a lack of reliable data make it difficult to ascertain the extent of this problem. The growth in bank-based loans in recent years also suggests that the ICETEX structure is not adequate to meet current needs, let alone new ones.

On balance, it seems advisable to build reforms on the existing structure of ICETEX and bank-based loans than to create an entirely new structure. ICETEX is too well regarded politically and too well established in the mind of the public to move away from it being an important component of any new student credit scheme. The two banks that currently make student loans also have behaved well in trying to fill gaps in the existing structure and deserve a chance to continue participating. In short, there is too much good and goodwill with what exists to justify the risks of going in some entirely different direction.

The question then becomes what reforms are needed to the existing student credit structure to make it more effective and more capable of meeting sharply increased demands. The obvious answer is the need for a secondary market (second floor bank) for student loans in Colombia. ICETEX's capacity to lend has declined sharply in the past decade because the government has withdrawn its direct provision of loan capital and there has been no effective alternative source of capital. By the same token, the banks have been limited in their ability to offer anything more than short-term credit because of the lack of a secondary market to provide greater liquidity.

The experience in the United States is instructive in this regard. In 1972, the Student Loan Marketing Association (Sallie Mae) was created through federal legislation as a private corporation to serve as a secondary market for the then small federally guaranteed student loan program. In this program, private banks made student loans that were fully guaranteed through a combination of state guarantee agencies and federal reinsurance. Banks that participated in the program argued that they were limited in how much they would lend because of the absence of a secondary market. The Congress responded by creating Sallie Mae as a federally chartered for-profit corporation as a secondary market for student loans that could both issue stock and incur debt to finance its operations.

As a federally chartered corporation, Sallie Mae enjoyed certain benefits over other corporations, including access to a "window" at the U.S. Treasury that lent to a small group of federally sponsored corporations at favorable rates (50 basis points or less over the treasury rate on comparable paper). In the past decade, Sallie Mae has privatized to allow it to broaden its charter beyond student loan activities and as a result no longer has access to preferential borrowing from the Treasury.

The initial purpose of Sallie Mae was two-fold: First, it could buy loan paper from banks or other loan holders as a way to create additional liquidity or it could "warehouse" loans by lending to banks that would use their student loan paper as collateral. In the intervening three decades, the activities of Sallie Mae have greatly expanded. It is now among the largest servicers of student loans, both of the loans it holds and as a contract servicer for loans held by others. Sallie Mae also aggressively entered the financial markets and has become an important player in hedging and securitization activities.

Since it was created, Sallie Mae has come to be a dominant force in the U.S. student loan industry (now holding more than one-third of all outstanding student loan paper), although a number of other secondary markets also exist to meet market needs. Collectively, all the student loan secondary markets hold perhaps one-half of all outstanding student loan paper.

The experience of Sallie Mae and other secondary markets in the U.S. suggests the potential benefits of Colombia of considering this approach. It is not a coincidence that student loan volume in the U.S. has grown roughly $1 billion to nearly $50 billion in the three decades since Sallie Mae was created. While there are many reasons that loan volume has grown in that time, the existence of a viable secondary market is undoubtedly a key one.

Policymakers in Colombia need to consider the experience of Sallie Mae and other secondary markets in the U.S. and elsewhere in their own context. Whether a second floor bank should be federally chartered or privately created is one key question. Whether ICETEX could serve its traditional role as well as being a second floor bank or whether some other existing or new organization can best serve this role is another key question. But what should not be lost in this conversation is the potential importance of creating greater liquidity for student credit in Colombia through a secondary market.

Whatever group or organization is assigned the responsibility for serving as a secondary market, private investors such as pension funds and individuals must be relied as a source of financing and should be assured a competitive return on investment. A description of how such a system might work in Colombia is provided in Chart 2. In terms of the roles of various organizations already involved in providing credit in Colombia, the following structure might be contemplated:

- The role of the government under the reforms proposed in this annex would be two-fold: 1) to establish through legislation and to provide start up funding for a student credit secondary market (second floor bank) to provide greater liquidity and 2) to provide a guarantee fee to ICETEX for new loans that it makes directly to students. International experience suggests this guarantee fee should be paid upfront as a percentage of loans guaranteed rather than as an open-ended commitment that would guarantee lenders or note holders a portion of losses on all loans made. Upfront fees are controllable and therefore limit budgetary exposure, whereas open-ended guarantees, even if on only a portion of defaulted loans, subject the government or other guarantors to a risk that few governments can undertake responsibly.

- ☐ The role of ICETEX would be: 1) to continue making and servicing loans to students who do not meet credit worthiness standards in the bank-based program, and 2) to possibly become a secondary market for both bank loans as well as those made by ICETEX. If ICETEX were to become a secondary market, however, its role as a public entity would become more blurred because it would now be using private investor funds to finance its second floor banking activities. It is our assessment based on the experience in preparing this project analysis that some organization other than ICETEX should take on the responsibilities of being a second floor bank.
- ☐ The role of commercial banks in providing student credit would continue largely as it is now—to lend to credit worthy student borrowers and to service those loans. Bank-based loans, though, would expand beyond the traditional role of providing of short-term credit because the creation of a secondary market would allow for longer terms. The existence of a viable secondary market would also stimulate the entrance of other commercial banks into student credit beyond the two banks currently engaged.
- ☐ The role of Fondo Guarantia in student crediting would also remain largely as it now is—to guarantee a portion of the loans made by the private banks with which it has agreements, although its mix of student credit would shift to longer term instruments.
- ☐ The role of HE institutions would be to accept less than the face value of the loan as payment for an equivalent amount of tuition fees. This would be key for allowing student borrowers to be charged an interest rate below market conditions in a largely privately-financed system of student credit. This kind of arrangement requires that 1) the loan proceeds be distributed to institutions while the credit note is obviously signed by the student and/or parents, and 2) that credit be limited to tuition and other fees charged by the institution and not to general living expenses of the student.

The administrative structure suggested above or others that policymakers in Colombia may wish to consider is not determinative of many other features of a student credit program that would have to be decided under any reform effort. These issues include:

- ☐ Student and institutional eligibility for credit.
- ☐ Interest rates and other loan terms and conditions.
- ☐ Repayment terms, including the possibility of income contingent schedules.

These design issues will be critical to the success of any effort in Colombia to reform student aid and to improve the financing of higher education overall. Once key structural decisions are taken, such as the shape and structure of a second floor bank, then these design issues of eligibility, subsidies, and repayments, will have to be addressed.

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The first section describes the current tertiary education system. The second provides an economic perspective and argues that the country faces two main obstacles to expansion: rationed number of enrollment places in the public institutions, and stifled demand for private higher education. The final section contains strategies and policy recommendations that support the Government's policy by focusing upon four core issues: (i) ensuring clear and progressive governance, (ii) inducing and assuring quality, (iii) promoting strategic levels of education and fields of study, and (iv) providing finance for equitable and expanded access.

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